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Fair Prices for Fair Profits

Examples of Lack of Courage and a Lack of Understanding of Pricing Factors—Manufacturers Thus Kept From Getting Proper Return

"UNINTELLIGENT pricing of products is the explanation for lack of sufficient profits in American industry," said William Lucius Churchill, industrial engineer, White Plains, N. Y., in commenting on "the editorial signed by A. I. Findley appearing on the front cover of THE IRON AGE of Jan. 7." "That message," he said, "calls attention to the most deplorable and inexcusable condition of American manufacturing."

To indicate something of the extent of existing faulty practices, THE IRON AGE asked him to mention a few specific cases, the hope being that the way might thus be made the easier for righting a condition permeating all industry.

Mr. Churchill cited the case of a special machinery builder who designed and built a machine for a customer on a cost-plus basis, charging \$2,000 for the completed machine. As he had invented a novel detail, he had this part patented and made preparations to market the machine generally. His first prospective customer was the company for which he had built the first machine. A price was requested on two additional machines and the manufacturer decided he could build them for \$1,000 each. Adding 25 per cent for profit he suggested to his financial backer and business associate that he could sell them for \$1,250 each. The financial backer, however, had no such rule-of-thumb idea of pricing and had the question studied from the standpoint of the value of the machines to the customer. The result was that the two machines were sold for \$4,750 each and both buyer and seller profited. This machine, Mr. Churchill said, has since developed a steady sale at prices never below \$3,250 and has competed successfully with other machines ranging from \$600 to \$2,100 for the same purpose.

"This merely illustrates," said Mr. Churchill, "that

when there is a legitimate demand for any product fair prices can be obtained. The temptation to lower the price and get more business has been resisted by the knowledge that low prices would not create sufficient demand to offset the proposed price sacrifices. In the case cited the prices have not proved unduly profitable, but they have enabled the firm to equip its plant with modern tools, develop foreign trade connections, improve its product and substantially increase its line, in addition to paying stockholders a fair return. The competing companies which sell on a basis of price only in the hope of building up greater volume stagger along from year to year hoping for better returns that never materialize and that make them look longingly toward a merger or consolidation as the solution of their profit problems."

To point out another experience, he told of two manufacturers making two sizes of an article costing \$10 and \$20. A adds 100 per cent, while B adds \$15 per unit. "We get prices from A of \$20 and \$40, while B asks \$25 and \$35. Of course A has to meet B's price of \$35, and B has to meet A's \$20 price, so we get a price level of \$20 and \$35, or an average of \$27.50 instead of \$30 that should be paid.

"Manufacturers are constantly striving to reduce costs," he said, "and then they pass these cost reductions on to their customers instead of to their stockholders. Despite the marked ability of American manufacturers along technical, operating, financing and distributing lines, we fail lamentably in our rewards to stockholders for the use of their capital in enabling us to exercise our exceptional talents."

Asked to give his opinion as to the outstanding reasons for the failure of American manufacturers to earn fair and reasonable profits, Mr. Churchill said:

"Manufacturers don't get fair prices because they

IN his capacity of industrial engineer, with a background of a varied experience in manufacturing, selling and consultation work, William Lucius Churchill, industrial engineer of White Plains, N. Y., has given intensive study to the subject of proper returns on capital invested in the manufacturing business. Mr. Churchill was invited by the Machinery Builders' Society of New York to deliver an address on "Dangerous Selling Prices" at a meeting at the Machinery Club, New York, on Jan. 7. Some of his statements at that time suggested the advisability of securing an elaboration of his ideas and the result is the accompanying interview.

Mr. Churchill has been connected in executive capacities with the National Pneumatic Service Co., Chicago; the Schrieber & Conchar Mfg. Co., Dubuque, Iowa; Yale & Towne Mfg. Co., Stamford, Conn.; McKinnon Dash Co., St. Catharines, Ont., and has served as industrial engineer and consultant with Stephen T. Williams & Staff, C. E. Knoeppel & Co. and the McDonald-Churchill Corporation; he has also been president of the Weeks Engineering Corporation and the Arizona Vulcan Mining Co.

do not ask for them. They are not in agreement in their understanding of how to arrive at fair prices, and, second, they lack the courage to adhere to fair prices, when they know what they should be.

"The lack of common understanding of how to arrive at fair selling prices is by far the greatest single factor in the prevailing low average of manufacturing profits. Lack of courage to adhere to fair prices when known is due chiefly to lack of understanding that fair prices adhered to will prove more profitable than panicky concessions. When this is thoroughly understood the knowledge gives manufacturers the courage of their convictions, so that they adhere to fair prices simply because they know that it is the only way to insure fair profits.

Pricing for Profit Little Understood

"Pricing for profit is very little understood by even the most thoroughly organized and progressive manufacturers. The success of those who do is appreciably handicapped by their enforced competition with those who do not.

"This lack of common understanding of sound pricing principles does not refer to lack of cost knowledge, as cost knowledge is no guarantee of satisfactory profits. In fact, it is all too often used to force narrower profits by disclosing just how cheaply goods may be sold without actual loss.

"Pricing of manufactured products is chiefly done with an eye to securing volume of business and with the hope that the volume will bring the profits as a by-product. Rarely are sales made with profit as a positive part thereof, and even when so made they are seldom adhered to, but are used as a trading basis."

The Question of a Fair Profit

Mr. Churchill was asked as to what, in his opinion, constitutes a fair profit.

"A great deal of confusion exists among manufacturers on this point," he said. "Their ideas are extremely varied and create profit levels well below what they should be even when there is uniform understanding of costs and even uniformity in these costs. Rule-of-thumb methods of adding to costs or estimates are very common and these rules frequently have no basis whatever for application to manufactured products."

Mr. Churchill pointed out that the purpose of his statements was not to unduly inflate prices and produce an unfair return to industry, and as an explanation of the dire need of better profits from manufacturing he cited the fact that less than 30 per cent of American manufacturing plants earn over \$5,000 a year net profit. With the remaining 70 per cent the line between profit and loss is so narrow that the keeping on the payroll of even a few unnecessary workers means the difference between making a little money or losing on their investment.

Many of the major distribution services, such as chain stores, commission brokers, sales agencies, etc., he emphasized, earn many times the profits of the producers of their wares and this for rendering a service requiring but a fraction of the money, skill, knowledge and enterprise.

Recently he had investigated 40 American manufacturing concerns and only five had what he considered reasonable profit ideals. These companies ranged from those employing about 20 men to some with several thousand employees. Some of the manufacturing plants had abandoned all attempts to make profits and had become reconciled to breaking even. None of the 40 companies, he said, was making fair profits, although the majority were making some profit. Even those companies which had proper profit ideals were unable to attain them, partly because of the low price levels prevailing in their industry. Continuing, Mr. Churchill said:

Causes for Failure to Price Properly

"There are two major causes for the lack of definiteness in regard to pricing even when costs are known.

"1—Lack of knowledge as to what volume of production normal profits should be based upon.

"2—Faulty profiting principles used in applying profits to the different lines of product manufactured.

"In addition to these causes of erratic and irrational selling prices we have also the prices made without cost knowledge or in utter disregard of that knowledge.

"Pricing without knowledge of the relation between the industry's productive capacity and the normal absorbing capacity of the trade (existent or prospective) is the most serious error that manufacturers make, in its effect upon stockholders' interests.

"Obsessed as we are with the idea that volume production reduces costs and that low prices stimulate sales, we go on cutting costs and reducing prices as fast and as far or farther with the expectation that these lowered prices will multiply our sales in still greater ratio.

"They don't. And then we make frantic efforts to secure enough business to operate to capacity. We send processions of salesmen around in each others' trails trying to take trade away from competitors. Selling costs multiply, sales prices decline, profits disappear. All because we fail to recognize that there is such a thing as a saturation point in the sales of our particular product and because we fail to make our selling prices what they should be to earn us our normal profit, when the normal market is supplied.

"One big province of manufacturers' associations is to enlighten their memberships in regard to the proportion of productive capacity of their industries to the normal market for their products.

"The manufacturer who figures prices on a basis of what they may be if he operates to full capacity, or on a basis of two or even three shifts when his industry as a whole can only average two-thirds its capacity, simply attempts business suicide. Sooner or later such a policy results in lessened net income, as his only source for more than his share of the prevailing business is from his competitors. They will not and cannot let him take and keep business from them. His prices are met and lowered and the entire industry gets into a state of chronic price warfare. No one profits except temporarily and the public ultimately pays for this warfare as it does for all warfares.

Excessive Capacity Not Sole Cause

"Most manufacturers in industries suffering from this condition blame excessive productive capacity as its cause. There are too many in this business they will tell you. If this were the true cause many of them would simply have to quit all business, for there are few if any lines of manufacture in this country in which capacity of production is not greatly in excess of the normal market for the product.

"Our very progressiveness, resourcefulness, and ingenuity are tending continuously to force our productiveness ahead of our markets. Our abhorrence of waste goads us on to find business for our idle or semi-idle equipment and buildings. We develop lines, sizes, styles, varieties and finishes beyond all reasonable requirements in the belief that they will enlarge our markets.

"We put on additional selling pressure. Sales! Sales! We must have sales to fill our plants! We don't get the sales we desire, so we fall back on our supposedly infallible salesmen, lower prices. Disguised possibly as extra discounts, rebates, commissions, allowances or what not. Result: Low prices; low profits; rancor and bitterness among competitors. Inadequate returns to enable upkeep and maintenance of plants; lack of development in the products and eventually a discredited and unprogressive industry.

"Profits make progress. Lack of profits can result only in stagnation and decay.

"It is the profitable industries that make the greatest development. It is the profitable industries that indulge in research, experiments and tests of products, equipment and markets, and that employ the best talent and pay the best wages and salaries, and in every way aid and develop our material welfare.

"When they lose sight of the necessity for keeping their prices at levels that insure these profits continu-

ing they quickly lose all of the advantages of their progressiveness.

"The American manufacturer has done a splendid job in developing his products and his markets but needs now to take a little thought for his stockholders in order that he may be supported in further developments of product and markets. With manufacturers averaging to earn the present small profits there is little encouragement to investors to assist in the starting of new manufacturing enterprises or increasing the activities of older ones.

"There is nothing inherent in manufacturing itself that tends to make it a precarious investment. There is no economic reason for the discouragement of fair prices for services rendered by manufacturers for their customers.

Reducing Selling Costs

"There are very few elements in sound pricing practice that need to be understood to insure profit stability in any industry. These few elements can be quickly absorbed by the heads of our manufacturing enterprises who must absorb them instead of leaving them to minor officials and employees, if they are to insure against faulty interpretation and application.

"Stabilized profits will make for lower costs because by common understanding of the elements in pricing that insure sound and continuous profits manufacturers will:

"1. Reduce selling costs now caused by excessive sales effort aimed to obtain impossible permanent additions to business.

"2. With reasonably uniform profits assured, manufacturers will not need to add the present high rate of profit necessary to offset the extreme recessions that now occur.

"A few industries have already undertaken education of members along these lines and with results that are very promising in their effectiveness and permanency.

"In one industry of some 30 manufacturers, 11

of the leaders have received the instruction and the effect has been to improve prices so that the entire industry is now reported to be on a profitable basis where formerly few, if any, made any money. There are no agreements as none are necessary, but a common understanding of pricing elements has reduced variations in selling prices to very small ratios. One firm formerly doing less than \$100,000 of business finds itself netting more than \$20,000 profit—and that after four years of no profit and with no additional business. Another in the same industry reports to the Stock Exchange earnings of well over \$100,000 for first nine months after receiving the instruction and after several years of no profit. A third firm has extricated itself from banker control and taken a new lease on business life because of substantial profits earned when they began pricing for profit in place of scrambling for volume.

"A few manufacturers with the courage of their convictions will adopt sound, sensible prices regardless of what competitors will do. Others, more timid, discourage sales on the less profitable lines and wait for others to name more satisfactory prices in the less desirable products before they will follow.

"To most manufacturers it is a revelation to find how little firmness they need to use to insure fair and reasonable returns for their efforts.

"Buyers are not generally anxious to deprive manufacturers of profits. The latter are almost entirely to blame in urging buyers to take their products at prices unprofitable to themselves.

"Manufacturers need common education in:

"1. What constitutes fair profits for their industry

"2. What proportion of their capacity must earn their normal profit

"3. How to apportion profit to different products.

"Group effort will quickly effect these understandings with resultant benefit of improved and stabilized profits for manufacturing industries."

Trade Associations Again Questioned

Federal Trade Commission Said to Be Trying to Determine What Is an Open Price Association

WASHINGTON, Jan. 26.—Acting under authority of a Senate resolution sponsored by Senator McKellar, Democrat, of Tennessee, and passed more than one year ago, the Federal Trade Commission has revived the old issue as to the legality of "open price" trade associations. The general opinion had been accepted that in decisions of the Supreme Court last year in the cases of the Cement Manufacturers' Association and the Maple Flooring Association, the question had been clearly answered. The circumstances governing the move of the commission at this time, however, were unusual and explain why trade associations throughout the country are being quizzed at this time.

It will be recalled that there was a division of opinion in the commission as to its authority to institute investigations called for by resolutions passed by a single branch of Congress. Some members of the commission maintained that that body could act only upon joint resolutions and only in instances where the proposed investigations related to violation of the anti-trust laws as distinguished from investigations relating to inquiries involving economic studies.

The upshot was that the question as to the authority of the commission to act under a resolution passed by a single branch of Congress was submitted to the Department of Justice. Attorney General Sargent held that either branch of Congress had authority to adopt resolutions calling for investigation by the commission.

The McKellar resolution is directed at so-called open price associations and asks the commission to

determine what associations of this character there are in the country and to ascertain their activities with a view to learning whether they are engaged in restraint of trade in violation of the anti-trust laws.

The commission itself has not made public the questionnaire but it is known that it has not a clear idea as to what constitutes an open-price association. This is said to be the reason why all associations known to the commission were sent the questionnaire. Some of them have replied that they are not open price associations and therefore that the questionnaire does not apply to them. This, however, is not acceptable to the commission and it is returning the questionnaire to those who have failed to fill it out.

Contention is made at the commission that this is necessary in order to determine what are and what are not open price associations. It remains to be seen what the commission might do in the event some associations decline to answer the questionnaire. This is understood to be elaborate and to call for the most intimate sort of information, which, it is pointed out, the associations might not want to disclose, not because it would reveal any illegal activity but because it is of a confidential business character.

A list, with analyses, of standard samples of ores, steels and metals, issued or in preparation, is found in a supplement to circular No. 25 (Sept. 1, 1925) of the Bureau of Standards.



E. C. BAIN



DR. B. EGEBERG

Steel Treaters'

Seventh Sectional Gathering at Buffalo—Electric Melting, Tool Steel Inspection and Macroscopic Examination Discussed—Splendid Financial Condition of Society

THE high standard attained in sectional meetings of the American Society for Steel Treating was emphasized to a notable degree by the one held last week in Buffalo. This meeting, the seventh of the kind, was conducted under the auspices of the Buffalo chapter of the society, at the Hotel Statler, Jan. 20 to 22. The registered attendance, which reached 300 members and guests, was distinguished by a large number of non-resident members—one of the largest of any previous gatherings of this character. Many of the leading metallurgists of the eastern section of the country were present, as were all of the national officers and all of the board of directors except one who was ill.

The established policy for these meetings was followed: a few technical papers and ample time devoted to plant visitations, affording opportunity for the officers and board of directors to become acquainted with the personnel and views of the members in different sections of the country. In a word, the meeting, like its predecessors, took on the importance of a small national convention.

Liberal abstracts of the technical papers, as well as an account of the other activities of the meeting, particularly the transactions of the directors, follow:

The Technical Papers

THE technical program was decidedly an evenly balanced one. Six papers were presented at the three different sessions, three of which might be classified as "practical" and three as non-practical or in the realm of physical metallurgy. As a whole, the papers, none of which were available in printed form, had a wide appeal to the entire membership present and were received with a great deal of attention by an attendance at each meeting, which approximated 200 members and guests.

The chairmen of the various sessions were Dr. Zay Jeffries, chief metallurgist, Aluminum Co. of America, Cleveland, and treasurer of the society; Prof. H. M. Boylston, head of the department of metallurgy, Case School of Applied Science, Cleveland, and R. M. Bird, Philadelphia, president of the national society. The three sessions were held on Thursday and Friday morning, and the last one on Friday evening.

Electric Steel Melting

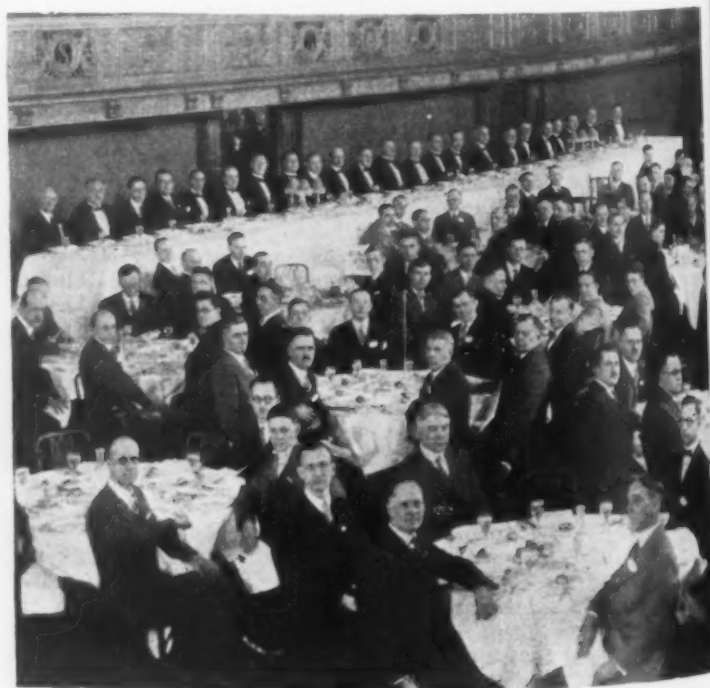
A valuable contribution to the literature on electric steel melting was a paper entitled "Electric Steel Melting from the Metallurgist's Viewpoint," by Dr. Birger Egeberg, metallurgist, Halcomb Steel Co., Syracuse, N. Y. The author, who is a graduate of the University of Christiania, Norway, as a metallurgical engineer in 1912, obtained his doctor's degree from the University of Aix La Chapelle in 1914. After serving in the

capacity of metallurgist for a large Westphalian steel company in Germany, and as chief metallurgist for a large nickel company in Norway, as well as chief metallurgist with the Stavanger Electro-Stahlverk in Norway from 1919 to 1924, he entered upon his present position two years ago. A liberal abstract of Dr. Egeberg's paper follows:

One of the main problems in the making of iron and steel is the reduction of iron from its oxide ores. Theoretically, this reduction is simple but, due to the inherent complexities of present-day smelting methods, direct reduction is still a thing of the future. The author here deals with the complexities met with in the conversion of pig iron and scrap materials into steel, especially as regards some features of electric furnace practice.

The electric furnace for the melting of steel became of importance when the expanding automobile industry began to demand high-grade steel in large quantities and at a low price. With the increase in the consumption of alloy steels, there developed an additional field of usefulness for the electric furnace, namely, the recovery of alloying elements from scrap material. The great national economic value of the electric furnace seems, hitherto, to have been given too little consideration.

In the melting down of the charge in the electric



Over 300 Members and Guests Attended the Banquet at the Treating, in the Ball

Winter Meeting

Delta Iron and a New Art in Heat Treating—X-Rays and Special Alloys—Size in Steel Hardening—Judge Gary and Mr. Schwab New Honorary Members



W. L. FINK



W. H. WILLS, JR.

furnace FeO is formed. This will dissolve in the bath until the saturation point is reached. When silicon and manganese are present in sufficient amounts in the bath, its saturation point for FeO is lowered. It is therefore advantageous to add austenitic manganese steel or ferromanganese as part of the charge. The preservation of a desirable amount of manganese in the bath predicated the use of partial oxidation during the melting down period. Other advantages of partial oxidation during melting are:

- 1.—Greater efficiency of the action of the white slag;
- 2.—Preservation of easily oxidized alloying elements.

Phosphorus is eliminated in much the same way as in the open-hearth furnace. On the other hand, the electric furnace is much more efficient in removing sulphur because in it it is possible to maintain a calcium slag, which effectively removes the sulphur from the bath.

In spite of its greater purity, electric steel did not live up to expectations. It led, however, to the belief that stringent chemical specifications are illogical because we lack sufficient data to inform us whether certain chemical elements or certain structures are or are not deleterious. The quality of the steel seems to be controlled by some factor not measured in the chemist's or metallurgist's laboratories.

Brittleness of Electric Steel

Heats of electric tool steel occasionally show great brittleness in the hardened condition. No peculiarity in the chemical or metallographic constituents has ever been detected to account for this brittleness. In steels made in the acid open-hearth or crucible furnaces, this defect is less common. It seems reasonable, therefore, to conclude that this difference in the behavior of these types of steels may be accounted for by differences in their manufacture.

In the crucible and in the acid open-hearth furnaces, the oxides in the bath are continually in reaction with the silicon in the linings of the furnaces. In the electric furnace the oxides in the bath react only with the overlying slag; the reacting surface per ton of metal is lower and the deoxidizing is therefore a slow process.

The quality of the steel depends not only on the extent to which deoxidization takes place but also on the amount and nature of the deoxidization products remaining in the steel. Woody structure in alloy structural steels, although not generally attributed to non-metallic inclusions, is always associated with inclusions, and, in the author's opinion, the extreme stringiness is due to the presence of sub-microscopic inclusions. The deoxidization products may be MnO , SiO_2 , Al_2O_3 or CO . The first three are solids and therefore less desirable than the gas CO . But deoxidization with carbon alone is never complete in present electric furnace practice because of the reversible reaction between FeO and C .

Deoxidization and Its Products

In the electric furnace, the deoxidization takes place between the bath and the slag, and products of deoxidization have but a short distance through which to rise to join the slag. Furthermore, a fairly long time is allowed for the bath to cleanse itself of these deoxidization products. In the open-hearth furnace, the final deoxidization takes place either just before or just after the metal is teemed and, because of the short time allowed for their escape, the products of deoxidization must, to a large extent, remain in the steel.

It is likely that oxygen is also present in the steel in the gaseous form. Nitrogen and hydrogen gas may also be present but it has not yet been established that the presence of either or both of the latter gases in steel is harmful.

In conclusion, the author states, he therefore believes that oxygen, whether in the form of dissolved gas or in the form of oxides, dissolved or precipitated, is responsible for most of those defects which today cannot be explained by the chemist or by the metallographist. In order to emphasize what has been said before, attention is called to the fact that steels of identical chemical composition, made from the same kind of raw materials in an identical way by the same men and in the same furnace, and given identical mechanical and thermal treatments, curiously enough may sometimes vary greatly in quality. Any conclu-



Winter Sectional Meeting of the American Society for Steel Room of Hotel Statler

sive explanation for this behavior has not yet been given, due mainly to the lack of adequate analytical testing methods. When some day our experimental methods have advanced sufficiently, we will, no doubt, learn that the affinity of iron for oxygen, as revealed in nature by oxidic ores and destruction of steel by corrosion, will explain to us certain defects which today are more or less of a mystery.

Discussion

In the discussion it was brought out that, so far as the relative superiority of crucible and electric steels is concerned, the electric has one decided advantage in that it can meet more easily the narrow ranges for carbon in certain specifications which are becoming more and more prevalent. Answering a question of W. J. Merton, Westinghouse Electric & Mfg. Co., Pittsburgh, as to whether there was not a difference in service stresses for electric steels of the same quality, Dr. Egeberg said that in a test conducted on a large number of rock drill steels from the same heat, some were found to be good and some were bad, but the cause was not determinable. Mr. Sherman, of the Universal Steel Co., Bridgeville, Pa., stated that he felt that the impression should not be left that deoxidizing conditions in American electric furnace practice were not fully carried out. After outlining some of the standard practice along these lines he said he believed that deoxidization was generally carried out as completely as possible.

Macroscopic Examination

Some of the recent experience in the macroscopic examination of steel was discussed in a paper entitled "Macroscopic Examination of Iron and Steel," by F. P. Gilligan and James J. Curran, of the Henry Souther Engineering Co., Hartford, Conn.

The authors call attention to the limited fields that can be examined by microscopic methods as compared to the sections which can be studied macroscopically, and also compare the labor, technique and training required by the two methods, the advantage being in favor of a macroscopic study, particularly for the non-technical steel user. A brief discussion of the more important structural changes which take place in the casting and working of steel is given in the paper to indicate the causes for the non-homogeneity of steel. Attention is called to the fact that steel has a "macro-structure" only because it is not perfectly homogeneous and perfectly clean.

The hot acid etch, using solutions of the common mineral acids, is recommended as the easiest way to develop the macrostructure of iron and steel, and the method of application generally followed by the authors is described. Numerous slides were presented to illustrate characteristic macrostructures and defects caused in manufacturing operations and heat treatment.

Discussion

In the brief discussion which followed the presentation of this paper by Mr. Curran, Dr. John A. Mathews, Crucible Steel Co. of America, New York, said that he thought too much value was sometimes given to the interpretation of macroscopic examinations. In his experience he had found such etching to reveal bad structure in tools which had given unusual results. He agreed, however, that within certain limitations its use was valuable. Prof. H. M. Boylston, Case School of Applied Science, Cleveland, pointed out that macrostructure should be regarded as a decided aid to microscopic examination and felt that this was its greatest field.

Inspection of Alloy and Tool Steels

"The Laboratory as a Factor in the Inspection of Alloy and Tool Steels" was the title of a paper by W. H. Wills, Jr., metallurgist Atlas Steel Corporation, Dunkirk, N. Y. The author emphasized that the modern tendency was for users of tool steel to buy according to their own specifications rather than to purchase

according to brand names. Mr. Wills therefore discusses some of these specifications and the necessary inspection covering tool steels and special alloy steels produced by tool steel mills. The present-day requirements of large users as to quality are discussed in detail. The need for a closer check on quality has contributed to the recent growth and development of the laboratory and the carrying out of the idea of technical control all the way from raw material to finished product, says the author. The duties of the chemical and physical laboratories and their relation to technical control and inspection were discussed. Special emphasis was placed by the author upon various tests carried out by the metallurgical laboratory. In conclusion the other activities of the laboratory, other than routine testing, such as the investigation of plants and the prosecution of research work, were touched on briefly.

Delta Iron and Iron-Chromium Alloys

Decided interest was manifested in the paper by E. C. Bain, metallurgist, Union Carbide and Carbon Research Laboratories, Inc., Long Island City, N. Y., who discussed "The Nature of the Alloys of Iron and Chromium." Before presenting his paper, Mr. Bain called attention to a paper decidedly analogous which is to be presented by W. P. Sykes, Cleveland Wire Works, General Electric Co., Cleveland, on "The Iron-Tungsten System" at the February meeting of the American Institute of Mining and Metallurgical Engineers and which has already been distributed in preprinted form. He spoke of the high character of Mr. Sykes' contribution and referred to the fact that he had been more or less acquainted with some of the work which Mr. Sykes had done on delta iron.

Mr. Bain in his paper, which was fully illustrated with lantern slides, describes the development and preservation at room temperature of delta iron solid solution. The alloys are heated above the range for austenite formation and, upon quenching in water, the transformation to austenite is suppressed and the delta iron solid solution is preserved unchanged in a permanently stable form, identical with alpha iron solid solution or ferrite. The name delta iron signifies only that the material has been heated to a higher temperature than permits austenite to exist, in contrast to alpha iron—a material which has been transformed from austenite by cooling through the transformation temperature at a proper rate. Physically the two are identical.

Iron, in its alpha form, accepts up to at least 60 per cent chromium in solid solution and probably forms a continuous solid solution series with it in all proportions.

The solid solutions of chromium in iron, containing less than about 14 per cent chromium, exhibit the alpha-gamma and gamma-delta transformations upon heating. The temperature for the alpha-gamma transition is raised with increasing chromium content while the gamma-delta change takes place at a lower and lower temperature as the chromium proportion is increased. The temperature range for gamma iron stability, therefore, becomes narrow above about 10 per cent chromium, and gamma iron is not formed at any temperature in the alloys having much more than 14 per cent chromium, except as influenced by carbon. In alloys richer in chromium, alpha and delta iron solid solutions are continuous and are physically identical. Delta iron solid solutions have been preserved, by quenching, permanently stable at room temperature.

The carbon, which is usually present in any alloys of this type, acts primarily to enlarge the region of austenite formation—raising the gamma-delta temperature and lowering the alpha-gamma temperature. Furthermore, carbon extends the region of gamma iron formation into the richer chromium alloys. Carbon, when present in as large amount as 0.35 per cent, may produce some gamma iron even in alloys containing 30 per cent chromium.

Both chromium and carbon render the austenite more sluggish and reluctant to transform into alpha iron (martensite) upon cooling. About 12 per cent chromium is required to preserve any appreciable austenite

at room temperature after a water-quench, even with the carbon as high as 0.35 per cent.

Discussion

A written discussion of Mr. Bain's paper by Dr. Zay Jeffries was read by Mr. Bayliss, editor of *Transactions*, and was as follows:

"I do not wish at this time to enter into a discussion of the many interesting scientific aspects of this paper, but desire only to call attention to certain of the broad aspects of what seems to be a new step in the field of ferrous metallography. The field embraces not merely the retention of so-called delta iron solid solutions, at low temperatures, but the practical heat treatment of these solid solutions. In other words, there has recently been developed what may be termed a new art in steel treating in which gamma iron plays no part. To the best of my information, the originator of this is W. P. Sykes.

"The following is quoted from the first Robert Henry Thurston lecture on 'Engineering and Science in the



H. J. FRENCH



J. J. CURAN

Metal Industry,' delivered by me on Dec. 3, 1925, at the annual meeting of the American Society of Mechanical Engineers in New York.

The following statement made by Prof. Bradley Stoughton in his "Metallurgy of Iron and Steel," page 403, fairly represents the state of the art with reference to the role of carbon in high-speed steel as well as other steel.

"It is commonly stated in the trade that tungsten will take the place of carbon in producing hardness, but this is not true. It is far more correct to say that tungsten will assist carbon in producing hardness and, therefore, with high-tungsten steels we may have lower carbon. The distinction may appear merely academic, but it is well worth recognition by those who expect to make a study of these steels. No amount of tungsten or any other element will make steel hard in the absence of carbon, or even when the carbon is low."

W. P. Sykes, Cleveland Wire Works, incandescent lamp department, General Electric Co., has recently made a development which changes this art. If about 22 per cent of pure molybdenum is added to pure iron it is found that the molybdenum is soluble in the iron at a temperature of say 1400 deg. C. On slow cooling, a compound of iron and molybdenum separates out in relatively large particles and the resulting alloy, when cooled to room temperature, is not very hard. The microstructure of this iron molybdenum alloy after being slowly cooled, is shown in Fig. 13.

When the alloy was quenched from the high temperature and solid solution preserved at room temperature, the Brinell hardness number in one instance was 214. This material is coarse-grained, as shown in Fig. 14.

Gamma iron plays no part in this system, the alloy retaining the body-centered cubic space lattice from room temperature up to the melting point. This quenched solid solution is supersaturated in molyb-

denum. On reheating to 600 to 650 deg. C., it is possible for the molybdenum atoms to diffuse in the iron space lattice and a portion of the molybdenum combines with some of the iron to form small (critically dispersed) particles of a hard iron molybdenum compound. Such an alloy, heated for 60 hr. at 600 deg. C., showed a Brinell hardness of 531, which is comparable to that of the hard steels. Not only is the hardness comparable to that of hard steels, but certain dies made of this alloy operated at a high temperature, showed up to 60 times the life of the best high-speed steel. The microstructure of the alloy in the hard state is shown in Fig. 15.

A New Science and Art in Steel Treating

"I should like to call especial attention to Mr. Bain's Fig. 7. The region of this diagram, marked "austenite," indicates that, with negligible carbon the iron-chromium alloys containing less than about 14 per cent, chromium will, when properly cooled, from a high temperature (above about 1450 deg. C.) transform from a body-centered cubic to a face-centered cubic space lattice, and then back to a body-centered lattice again. It also indicates that with more than about 14 per cent chromium only one type of crystal structure obtains unless carbon is present.

"As is shown in the preprint of the paper by Sykes "The Iron Tungsten System," to be given at the annual meeting of the American Institute of Mining and Metallurgical Engineers in February, 1926, this identical phenomenon is shown in the carbon-free alloys of iron and tungsten. While Mr. Bain has been aware of these results of Mr. Sykes' for a good many months, he quite properly avoided mention of this information, which he no doubt regarded as confidential. It might be mentioned that the "earlier work" described in Mr. Bain's paper on page 10 of the January issue of *Transactions* of the A. S. S. T. was done by Bain when he was connected with the Cleveland Wire Division of the General Electric Co.

"I know that the other members of this society will join me in welcoming the advent of this new science and art in the field of steel treating."

J. V. Emmons, Cleveland Twist Drill Co., Cleveland, related some interesting experiences which took place about 1915. In heating to a high temperature some high-speed steel, there was discovered a structure, which at the time had not been seen before and which it was impossible to identify. Mr. Emmons stated that Mr. Bain's paper evidently threw light upon the situation in that the material formed, in the experience referred to, was probably delta iron. At any rate, steel so treated could not be restored by any further treatment and was virtually worthless as a cutting tool.

In response to one or two questions Mr. Bain said that the etching medium, used in his work, was aqua regia mixed in equal proportions with dilute glycerine and that the period of immersion was as high as 45 min.

The X-Ray and Pure Iron-Carbon Alloys

An interesting contribution to the X-ray analysis of metals was contributed by Dr. W. L. Fink, research department, Aluminum Co. of America, Cleveland. The title of his paper was "Influence of Changes in Carbide Concentration on X-Ray Structure of Some Pure Iron-Carbon Alloys." The material used was Armco iron properly melted with increasing contents of carbon. The author's presentation was interspersed with a large number of lantern slides. He prefaced the paper with a brief review of the production and diffraction of X-rays and outlined some of the methods of X-ray crystal analysis. The investigation embraced two series of pure iron-carbon alloys with a constant amount of impurities (less than 0.10 per cent). At the end of the presentation of his paper, Mr. Fink read the following conclusions:

1. Changes in the dimensions of the minimum alpha iron lattice (body centered cubic) which take place during heat treatments are small (0 to 0.30 per cent approximately) and are a function of the carbon content and heat treatment. The side of unit cube increases slightly as the carbide concentration increases, but the change is not uniform throughout the lattice.

2. The gamma iron lattice (face centered cubic) also changes with carbon-content and heat treatment. The higher the carbon content and the more drastic the quench, the larger the size of unit cube. The range of values of a encountered in this work was from about 3.56 \AA^3 to 3.608 \AA^3 .

3. With drastic quenching of eutectoid and hypereutectoid steels, there is formed a crystal structure which has not been previously described, and which seems to be a body centered tetragonal structure. The body centered tetragonal lattice is not uniform with the lower carbon contents, but with higher carbon contents the lattice becomes fairly uniform. With the 1.50 per cent carbon specimen, the value of a was 2.85 \AA and the value of c was 3.02 \AA .

4. The body centered tetragonal lattice is less stable at low temperature than the gamma iron lattice. The body centered tetragonal lattice disappears on tempering at 100 deg. C. while the gamma iron does not disappear until 200 deg. C. is reached and, in the case of the 1.50 per cent carbon specimen, it had not entirely disappeared then.

5. The relative quantities of the three kinds of lattices which are produced by quenching are functions of the carbon content and the rate of cooling.

6. Carbides, for some unknown reason, do not in general give lines on the film. By annealing the high carbon steels, carbide lines are obtained. Thorough annealing or spheroidization might cause them to appear with lower carbon contents.

It was suggested that future work might profitably be done on the structure of steel at elevated temperatures as revealed by X-ray patterns.

Size and Shape in Hardening Steels

"A Report Supplementing Work Relating to the Effect of Size and Shape on the Hardening of Steels" by H. J. French and O. Z. Klopsch of the Bureau of Standards, Washington, was presented by Mr. French. It contains a discussion of time-temperature cooling curves on the center of steel samples of various sizes and shapes, quenched into ordinary coolants such as water, a commercial quenching oil and air. Based on the described experiments, a method is outlined by which cooling curves for various sizes and shapes quenched from various temperatures can be derived provided the curve for one size from one quenching temperature is available and one constant is known for the coolant.

Discussion

Following the presentation of the paper, there were numerous miscellaneous questions asked of the authors and it was brought out that, so far as the effect of a polished or a rough surface was concerned, it had been impossible to determine whether these really made any difference, largely because of the film of oxide which necessarily accompanies an investigation of this nature.

Board and Committee Meetings

The board of directors and several committees held meetings on Jan. 20 and 23. Some of the results follow:

Gary and Schwab New Honorary Members

One of the most interesting announcements of the meeting of the board of directors, held Wednesday, Jan. 20, was the report of a committee appointed to notify Judge Elbert H. Gary, chairman of the board of the United States Steel Corporation, and Charles M. Schwab, chairman of the board of the Bethlehem Steel Corporation, stating that both of these distinguished men had accepted the invitation of the board to become honorary members of the society. The formal public announcement of these additions to the honorary membership of the society will be made at the annual banquet during the 1926 convention and exposition to be held in Chicago, the week of Sept. 20. It was also announced that the Drake Hotel, Chicago, has been selected as the headquarters for that meeting.

Some interesting facts came to light concerning the financial condition of the society. The financial budget for 1926 calls for an expenditure of \$147,850. The report of the treasury for 1925 reveals an excess of income over expenditure of about \$25,000, bringing the net resources of the society at the end of only five

years to about \$88,109. The Henry M. Howe fund was increased from \$3,000 to \$5,000.

A committee consisting of directors W. S. Bidle, F. G. Hughes, and W. H. Eisenman was appointed to investigate invitations from the Philadelphia and New York chapters for the 1927 convention.

The report of the committee, having charge of the 1926 convention and exhibition, stated that an invitation had been extended to the Society of Automotive Engineers to hold their production meeting in Chicago in September, and also to the American Society of Mechanical Engineers to participate in the machine shop practice division of the exhibition.

All standing committees were reappointed and two new members were added to the recommended practice committee, namely, George H. Wright, General Electric Co. and P. C. Osterman, president American Gas Furnace Co., Elizabeth, N. J., with Dr. F. C. Langenberg, Watertown Arsenal, Watertown, Mass., appointed to take the place of R. M. Bird, resigned.

President Bird announced his policy of periodical conferences with the executive committees of the various chapters, including the two on the Pacific Coast during the coming year. It is also the plan of various directors to meet with the executive committees of the various chapters. The establishing of 24 new chapters, regarded as possible was discussed. Mr. Bird resigned as a member of the committee on heat treatment definitions, and was replaced by Prof. Bradley Stoughton, Lehigh University. This committee is cooperating on this subject with the S. A. E. and the A. S. T. M.

The Banquet

OVER 300 sat down at the banquet in the ballroom of the Hotel Statler Thursday evening, Jan. 21. Besides the speakers there were about 20 guests of honor at the head table. The post-prandial program was opened by G. F. Armstrong, chairman of the Buffalo chapter and in charge of the efficient arrangements made for the success of the convention. He introduced as toastmaster W. T. Buckley of the Buffalo Chamber of Commerce. The various speakers were R. M. Bird, president of the national society; Dr. M. L. Hartmann, director research laboratory, Carborundum Co., Niagara Falls, N. Y.; Albert F. Dohn, president Atlas Steel Corporation, Dunkirk, N. Y.; Prof. W. Z. Irons, University of Buffalo, and W. H. Cutler, metallurgist Lackawanna plant, Bethlehem Steel Corporation, Lackawanna, N. Y., who spoke in place of T. W. Burns, general manager of the plant, who at the last minute could not come. A feature was the large representation from various steel plants in the district, who, when called upon by the toastmaster, arose in a body and were roundly cheered.

Committee Meetings

The entire committee on publications, consisting of 12 members, with Prof. H. M. Boylston, chairman, had an enthusiastic meeting, discussing various policies and particularly the question of practical and non-practical papers. Later in the day this committee joined with the board of directors and discussed features of its report. Late in the same day there was a joint conference of the board with the recommended practice committee at which it was brought out that data sheets on 38 subjects had been published covering 283 pages, with material for 21 additional subjects printed or on the way to the printer.

On Saturday, Jan. 23, the recommended practice committee held an important meeting at which the attendance was large.

Plant Visitations

Visits to industrial plants in the neighborhood of Buffalo, to which the afternoons of Thursday and Friday and the morning of Saturday were devoted, were largely attended. The plants visited were those of the Donner Steel Co.; the Lackawanna plant of the Bethlehem Steel Corporation; the Curtiss Aeroplane & Motor Co.; the Pierce-Arrow Motor Car Co.; the American Brass Co.; the Simonds Mfg. Co., Lockport, N. Y.; the Carborundum Co., and the Niagara Falls Power Co., Niagara Falls, N. Y., and the Atlas Steel Corporation, Dunkirk, N. Y.

Tonawanda Furnace Modernized

Rebuilt Stack Produces More Than Two Old Furnaces—
Anemometer for Ore Bridge and Heat Exchanger
for Washed Gas Are Features

WITH the acquisition early in 1923 of the Tonawanda furnaces, North Tonawanda, N. Y., the American Radiator Co., New York, obtained a potential independent source of pig iron, and through a subsidiary organization—the Tonawanda Iron Corporation—took steps immediately to modernize the plant. This consisted of two old furnaces without rigs for unloading and stocking ore. It was decided to abandon "B" furnace, and entirely to rebuild the "A" furnace. The rated capacity of the reconstructed stack is 400 tons of foundry pig iron a day, but the average production has been well over that amount. In fact, the output of the single furnace is more than the production of the two old furnaces together.

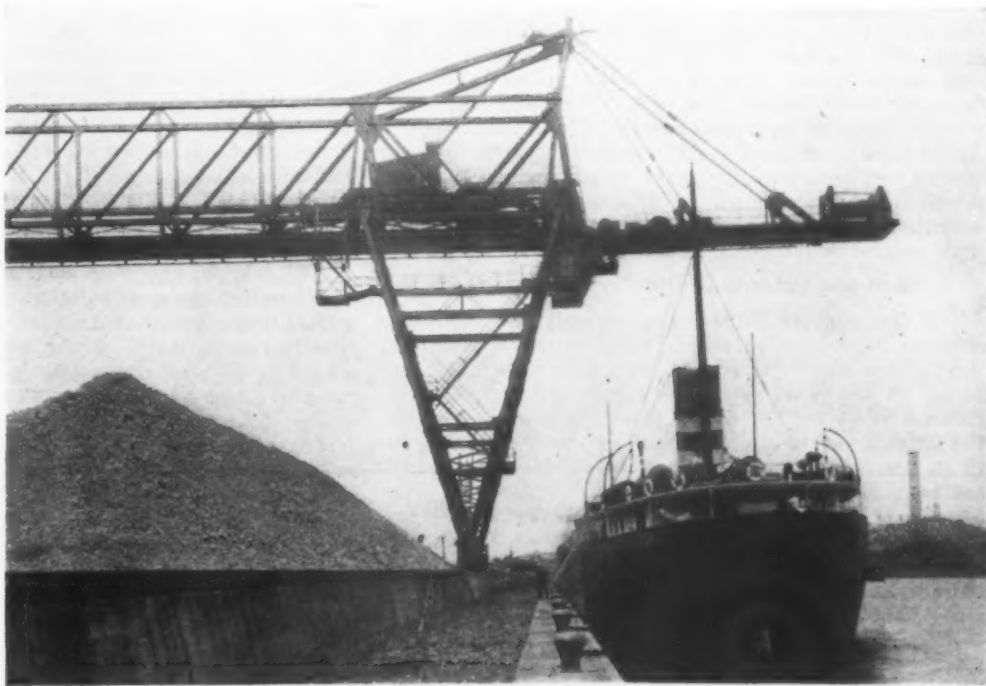
ing a 12-ton grab bucket with a capacity of 500 tons per hr.

Anemometer on Ore Bridge

Because of the destruction of and damage to several pieces of similar equipment in the Lakes region by severe storms, this bridge, in addition to the usual safety appliances, is provided with an anemometer which automatically cuts off the power and sets the rail clamps when the wind reaches a certain predetermined velocity. The dock and yard are capable of extension and increase of capacity.

Material in the yard is transported to the individual steel storage bins by the bridge and a 50-ton transfer

The Ore Bridge Is Provided with an Anemometer Which Automatically Cuts Off the Power and Sets the Rail Clamps When the Wind Reaches a Predetermined Velocity. The bridge is of the combined unloader and stocking type



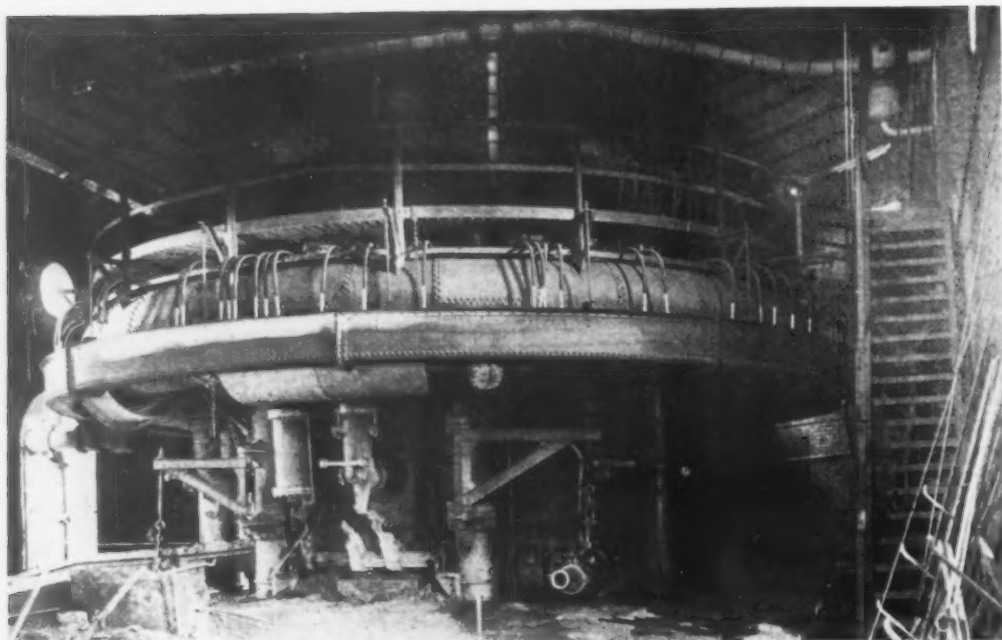
The "A" furnace was originally built in 1873 and remodeled in 1918. It was of the open top hand-filled type, and although well located as to raw materials, had become antiquated as to equipment and was burdened with operation costs which made it difficult to meet competition. In the modernization only the essentials were installed, with the aim not only to place the stack upon a par with the best in the country, insofar as economy of labor, unit capacity and efficiency of parts were concerned, but—as important—to keep plant investment and fixed charges low, thereby insuring a minimum cost of iron production.

The plant site consists of 127 acres fronting on the Niagara River. Furnaces and equipment occupy less than half of this area, leaving ample room for future improvements and extensions. There is a dock, 500 ft. long, of reinforced concrete construction, heavily piled and riprapped, and capable of handling the largest ore carriers now operating on the Great Lakes. Running the full length of the dock is a stock yard, 268 ft. wide from pier to the shear legs of an ore bridge, the bridge pier being incorporated in the dock design. The ore bridge is of the combined unloader and stocking type. It was furnished by the Mead-Morrison Mfg. Co., East Boston, Mass., and is of the man-trolley design, operat-

car supplied by the Atlas Car & Mfg. Co., Cleveland. The system of storage bins consists of seven ore, stone and scrap bins, each of 4000 cu. ft. capacity, and one coke bin of 16,500 cu. ft. capacity. The coke bin is centrally located over the skip pit and so arranged that the coke is screened by a set of bar grizzlies and delivered to the skip cars by gravity. The coke braize falling through the grizzlies drops upon either one of two lateral belt conveyors, and is fed to a belt bucket elevator, which in turn discharges the braize to an overhead carload storage bin for intermittent delivery to railroad cars at yard elevation. The ore, stone and scrap bins are equipped with the Freyn double-lip gates, which are actuated by an air cylinder mounted on the scale car. This is the sixth installation of this type of mechanically operated bins and gates. They are said to insure free running ores, accurate weights, absence of spills on the stock house floor and economy in labor. Their use also makes it easier to keep high grade men on the filling job, it is asserted.

There are two scale cars of the single hopper type with weight recorder and with air brakes and air-operated doors. They also were furnished by the Atlas Car & Mfg. Co.

The skip incline, 145 ft. in length, is of the canti-



The Furnace is Blown by Eight Tuyeres Spaced Between Eight Columns. A larger bustle pipe is a feature of the new construction. The tuyere jacket consists of a solid steel plate armor with openings for tuyeres and cooling plates. The hearth jacket is of built up construction, composed of a steel plate jacket lined with 14 cast iron cooling segments with cooling pipes integrally cast

lever double-track type, so supported by an A-frame that side thrust is removed from the furnace shell. The skips, which are of the bail type, are operated by an Otis steam-driven single drum hoist engine controlled from the stock house. The bells are rigidly supported by the furnace top, independent of the skip incline. An advantage claimed for this construction is that an uneven settlement, if it should occur, could not throw the bells out of their proper alinement. The bells are operated by steam cylinders in the skip hoist house, with control in the stock house.

Shell and Columns of Old Furnace Retained

Of the original furnace proper, only the shell and columns have been retained. Prior to the remodeling, the furnace was 77 ft. 8 $\frac{1}{2}$ in. high with a 19-ft. 4 $\frac{1}{4}$ -in. bosh. In the remodeled stack the height has been increased to 84 ft. 3 $\frac{3}{4}$ in. by providing a dome top on the existing shell, and the bosh has been increased to 19 ft. 6 in., with the result that the volumetric capacity has been increased by approximately 2000 cu. ft. The furnace is blown by eight tuyeres equally spaced between the eight columns. A larger bustle pipe and hot blast connection have been provided. The hearth jacket is of built up construction, composed of a steel plate jacket lined with 14 cast iron cooling segments with cooling pipes integrally cast. The tuyere jacket con-

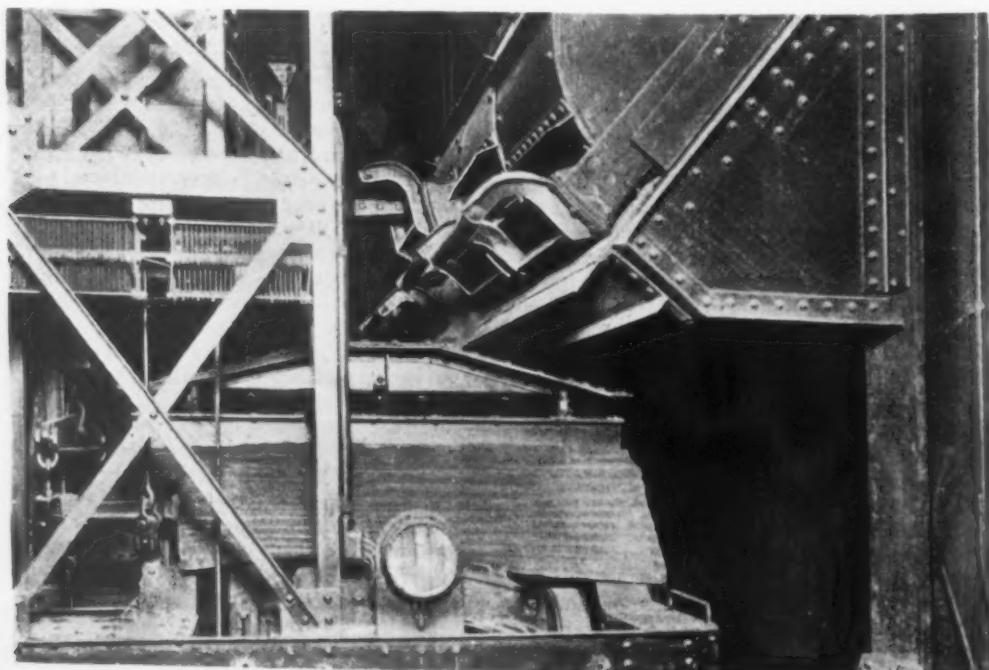
sists of a solid steel plate armor with openings for the tuyeres and cooling plates. The bosh construction is reinforced by five steel bands securely held in place by cast iron supports. For cooling the bosh 226 cooling plates, inserted in cast iron boxes, are provided, but no cooling has been provided above the mantle. The cinder notch is located 53 deg. from the iron notch. The top construction is of the double bell arrangement, incorporating a McKee revolving distributor. The lining is of Olive Hill brick, furnished by the General Refractories Co., Philadelphia.

The original layout of cast house has been retained with parallel iron and cinder tracks on the one side and a track for removal of dust catcher dust on the other. Iron is run to ladles on the nearer track and transported to the pig casting machine for casting. Slag is run into cinder cars and is sold and delivered hot to the Buffalo Slag Co.

Blast for the furnace is heated by six of eight original 18-ft. x 80-ft. two-pass side combustion stoves, each having a heating surface of approximately 32,000 sq. ft. These stoves have been recently equipped with Steinbart pressure burners.

The gas system has been completely revamped. The furnace has been provided with two new steeple-type offtakes, each provided with Baer safety bleeders. From the top of the offtakes, two downtakes extend to the

Ore, Stone and Scrap Bins Are Equipped with Double-Lip Gates Which Are Actuated by an Air Cylinder Mounted on the Scale Car



new dust catcher. Water seals are provided, and alterations have been made in the gas main system to decrease the resistance to the greater rate of gas flow and to increase the flexibility of the system.

Heat Exchanger Removes Moisture from Gas

Gas for both stoves and boilers is cleaned by a 14-ft. Brassert gas washing unit. A heat exchanger incorporated in this design passes the hot raw gases in pipes counter-current to the cold clean gas. A portion of the heat is thereby transferred to the washed gas, increasing its sensible heat and raising its temperature above the dew point, thereby overcoming the detrimental effect of moisture at the gas burners. The overflow water from the washer is led in an open trench to a 40-ft. Dorr thickener, where the flue dust is removed and the water clarified before it is wasted to the Niagara River. The sludge obtained from the Dorr thickener, containing approximately 55 per cent moisture, is pumped to an Oliver continuous filter, where the moisture content is reduced to 25 per cent. The filter cake thus obtained is discharged to railroad cars.

The original power and blowing equipment was suitably rebuilt to meet the more exacting needs of the new furnace. Steam is produced by eight Babcock & Wilcox longitudinal drum boilers fired by blast furnace gas. Blast for the furnace is furnished by five reciprocating blowing engines with a combined capacity of 80,000 cu. ft. per min. In planning plant equipment steam rather than electrical drives have been given the pref-

erence and, as a result, a material reduction in the electrical demand is obtained. Under normal operating conditions power is purchased from the Tonawanda Power Co., but the plant is prepared to generate its own in case of an emergency, by use of an existing engine-driven generator. As the power purchased is 4400-volt 25-cycle alternating current, a new 500-kw. Allis-Chalmers motor generator set has been provided for the direct current loads.

The original water system consisted of pumps at the power house, which drew from a well in the power house basement. The well was supplied by a gravity intake extending from the dock front through the ore yard to the power house. To safeguard the water supply, a new gravity intake has been provided, extending from the north end of the plant and clear of the ore yard. A new turbine-driven, centrifugal, service water pump has also been installed. The furnace bosh water is reused for the gas washer water supply.

The steam piping has been completely changed. Considerable old piping was removed and simpler lines and connections were provided. Duplicate leads have been installed at certain points. This work was done to eliminate condensation and loss, and to increase plant safety.

The remodeling has permitted a material reduction in the number of men required for operation of the plant, besides augmenting the tonnage output. The Freyn Engineering Co., Chicago, had charge of the design and construction. The furnace was blown in Nov. 1, 1924. Robert McClurkin is general superintendent.

Manufacturing Hazards and Profits

Deficits Shown Each Year by 35 to 40 Per Cent of Industrial Companies—Saved Only by Variability of Adversity

BETWEEN 35 and 40 per cent of the manufacturers of this country showed deficits in the years 1920 to 1923, said Charles Piez, president Illinois Manufacturers' Association and chairman Link-Belt Co., Chicago, in a statement before the Interstate Commerce Commission, Jan. 15. The great hazards of manufacturing were emphasized by him to indicate the danger of radical changes in the existing rate structure, which is now the subject of an investigation by the commission.

Net earnings of industry for four years averaged 6 per cent, as against 4.50 per cent for 61 railroads, but, says Mr. Piez, considering the greater hazards in industry, its lesser stability and higher mortality, the difference is no greater than it should be.

One of the popular fallacies of the day, according to Mr. Piez, is that all manufacturing is so profitable that the imposition of additional burdens is but an equitable process of reducing excessive profits.

Mr. Piez's statement is, in part, as follows:

"Manufacturing is an extremely hazardous undertaking with a high percentage of mortality. It is subject to many vicissitudes, usually brought about by conditions over which the manufacturer has no control.

"Let us refer to the condition in the textile industries due to the changes in fashion of women's attire, to the shrinkage in leather manufacture due to the supplanting of high shoes with low, and the substitution of fabric for leather. The introduction of the radio almost wiped out the demand for victrolas, the development of the cotton mills of the South brought heavy losses to the cotton industry of New England. The excessive development of the facilities of certain industries demanded by the war has resulted in heavy losses to these industries since.

"The loss from shrinkage in inventory values is a constant menace to that large group of manufacturers who are compelled to manufacture in advance of actual sales.

"But the hazard to the manufacturer arises not

only out of these external conditions, but out of internal ones as well. Inventions that make for improvement and economy of manufacture often involve the scrapping of a considerable part of his equipment with a consequent loss.

"The railroads, while subject to rate control by your commission, are at least not subjected to price reduction by reason of a reduced demand for service.

"In this respect the farmer and the manufacturer suffer equally, but the latter suffers the additional disadvantage of carrying a much higher proportion of overhead during periods of small demand than the farmer. The consumption of power varies but little between full load and half load, depreciation, like interest, works continually, and the supervisory and technical staffs must be paid whether the factories turn out much or little.

"As a result when demand drops, costs go up and prices go down.

Wide Fluctuations in Profits

"This accounts for the very wide fluctuations that frequently occur in returns on invested capital of manufacturing plants in successive years.

"The attached table, taken from the *Standard Daily Trade Service* of June 15, 1925, shows net earnings expressed in the number of dollars earned on each \$100 of invested capital rounded off to the nearest quarter dollar.

"The table covers groups of industries, the number constituting each group being indicated in the first two columns.

"I am giving but 11 of the 34 groups shown in the copy of the index above referred to.

"Deficits are indicated by prefixing a 'd.'

"The entire industrial group given in the June 15 issue of the *Standard Daily Trade Service*, consisting of 647 companies divided into 34 groups, shows average net earnings for the four years of \$6 per \$100 of invested capital, while the railroad group, consisting of

61 roads, shows an average of \$4.50 per \$100 of invested capital.

"Certainly considering the greater hazards in industry, its lesser stability and higher mortality, the difference is no greater than it should be.

Deficits for Large Percentage of Manufacturers

"Confirmation of these statements is given by the Statistics of Income published by the United States

Standard Daily Trade Service June 16, 1925 Index of Business Profits

	Number of Companies		Profits Index				Average
	1924	1921-23	1924	1923	1922	1921	
Automobiles ..	23	26	\$11.00	\$15.50	\$12.50	d\$6.75	\$8.00
Clothing	15	17	4.00	9.75	10.25	4.50	7.25
Copper and brass	32	34	2.50	3.50	0.75	d2.75	1.00
Farm implements	8	9	4.25	2.25	d0.25	d2.25	1.00
Fertilizers	5	5	0.75	1.75	1.75	d10.75	d2.00
Leather	4	4	1.50	d4.00	3.50	d10.50	d2.50
Machinery	21	22	6.25	7.75	4.25	d1.25	4.25
Paper	12	14	6.50	7.00	2.00	0.00	4.00
Steel and iron ..	46	47	5.00	6.50	3.00	2.00	4.25
Textiles—Cotton ..	11	14	1.00	5.25	2.25	3.75	3.00
Textiles—Woolen ..	4	4	d4.75	5.75	5.25	3.00	2.25

Treasury Department, compiled under the direction of the Commissioner of Internal Revenue, for the years 1920, 1921, 1922 and 1923.

"Of the 78,171 manufacturing corporations reporting in 1920, 49,425, or 63.2 per cent, reported a net income of \$4,116,424,329, subject to a tax of about \$945,000,000, and 28,746 corporations, or 36.7 per cent of the total reported a deficit of \$834,146,400.

"The year 1920 was, on the whole, a satisfactory year for manufacturing; yet 36 7/10 per cent of the total number of corporations reporting operated at a loss.

"In 1921 of the total number of manufacturing corporations reporting, viz.—79,748, only 37,030, or 46.5 per cent, reported net incomes of \$1,777,785,608, on which they paid \$351,000,000 Federal tax, and 42,718, or 53.5 per cent reported deficits of \$1,898,831,377. In other words, the vast investment in manufacturing industries totaling more than \$35,000,000,000, showed an actual loss, including Federal taxes paid in 1921, of over \$472,000,000.

"In 1922 the total number of manufacturing concerns reporting was 82,485, and of these 48,697, or 59 per cent, reported net incomes of \$3,454,419,673, subject to a Federal tax of \$389,775,530, and 33,788, or 41 per cent, reported deficits totaling \$813,413,029.

"In 1923 the total manufacturing corporations reporting was 85,199, out of which 53,795, or 63 per cent, reported net incomes of \$4,271,899,449, subject to a Federal tax of \$484,863,656, and 31,404, or 37 per cent, reported deficits of \$701,011,681.

Large Investment in Manufacturing

"Of an aggregate fair value of \$75,783,000,000 reported in 1922 by approximately 367,000 corporations in all lines of activity, for purposes of capital stock tax, \$28,000,000,000, or 36.8 per cent, is reported by the manufacturing group. Manufacturing is, in the point of investment, far more important than the finance banking and insurance group, which represents but 19.8 per cent of the total; transportation and public utilities, which represent 16 per cent; trade and merchandise representing 11.4 per cent; and mining and quarrying, which represent 9.8 per cent. Yet of this most important group, with its vast investment and wide variety of activity, somewhere between 35 and 40 per cent is constantly near the bread line. Only the fact that adversity rarely hits the same classes of manufacturers for any long extended period saves them from being wiped out."

Teaching the Young Idea To Mold

How Indianapolis Foundrymen Plan to Train Apprentices for Better Production

ARRANGEMENTS for a complete course on the "Technique of Molding" and on related subjects have been completed by a committee of Indianapolis foundrymen who are members of the National Metal Trades Association. The course will be given by the vocational department of the Indianapolis public schools and local foundrymen have pledged 30 apprentices and other employees for the initial class. Decision to conduct the course was reached after a series of conferences between A. J. Allen, secretary, Indianapolis Metal Trades Association, Denman Kelly, state supervisor of vocational education and Harry E. Wood, director of industrial and vocational education in the Indianapolis public schools. The outline of the course is as follows:

Technique of Molding

I.—Hand Molding

A. Bench molding

1. Patterns
 - a. Solid
 - b. Split
 - c. Gated
 - d. Cored
 - e. Match plate
 - f. Oil match
2. Bottom boards
3. Flasks
 - a. Snap
 - b. Solid
 - (1) Wood
 - (2) Metal
4. Ramming
5. Gating and feeding
6. Chills
7. Facing

B. Floor molding

1. Flash
2. Open sand

A. Squeezing

B. Jolt ramming

8. Parting
9. Riddling
10. Venting
11. Sprues
12. Slicking
13. Rapping
 - a. Hand
 - b. Vibrator
14. Core setting
15. Gaggers
16. Chaplets
17. Pattern drawing
18. Clamping or weighting
19. Skin drying
20. Baking
21. Cleaning patterns

3. Pit or loam molding

II.—Machine Molding

C. Roll over

D. Pattern drawing

III.—Pattern Making

A. Kinds

1. Wood

2. Metal

B. Type

1. Solid
2. Split
3. Gated

C. Draft

D. Shrinkage

E. Rough and finished allowance

IV.—Molding Materials

A. Sands

1. Molding sands
 - a. Light
 - b. Medium
 - c. Strong
2. Free sand
 - a. Sharp or fire
 - b. Beach sand
3. Sand preparing
 - a. Tempering
 - b. Mixing
 - c. Flour facing
 - d. Wetting
 - e. Screening
 - f. Milling
4. Mixtures
 - a. Sand
 - b. Clay
 - c. Flour

B. Facings

1. Graphite
2. Sea coal
3. Flour

C. Miscellaneous

1. Fire clay
2. Parting dust
 - a. Burnt sand
 - b. Sharp sand
 - c. Prepared partings
3. Core binders
 - a. Rosin
 - b. Molasses
 - c. Oils
 - d. Compounds
 - (1) Liquid
 - (2) Dry

V.—Casting Material

A. Ferrous

1. Gray iron
2. Malleable iron
3. Steel

B. Non-ferrous

1. Aluminum
2. Alloys
 - a. Brass
 - b. Bronze
 - c. Others

VI.—Equipment

A. Hand tools

- B. Machine equipment
 1. Molding machines
 - a. Hand
 - b. Power
 2. Riddles
 - a. Hand
 - b. Power
 3. Mixer

- a. Sand
- b. Facing
4. Tumbling mills
5. Sand blasters
6. Grinders
7. Hoists and cranes
8. Drop hammers
9. Conveyors
 - a. Endless belt or chain

- b. Traveling cranes
- c. Trucks
- 10. Ladders
- 11. Furnaces
 - a. Kinds
 - (1) Cupola
 - (2) Reverberatory
 - (3) Open-hearth
 - (4) Electric
 - (5) Annealing
 - (6) Crucible
- 12. Testing instruments

C. Fuels

- 1. Coke
- 2. Coal
 - a. Lump
 - b. Powdered

VII.—Breaking and Cleaning

- A. Dumping molds
 - 4. Sand blasting
 - 5. Pickling
- B. Cleaning castings
 - 1. Hand cleaning
 - 2. Removing cores
 - 3. Tumbling
- C. Chipping and grinding
- D. Inspecting and testing

VIII.—Cores and Core Making

- A. Tools and equipment
 - 1. Core boxes
 - 2. Core plates
 - 3. Sweeps
 - 4. Mallets
 - 5. Dryers
 - 6. Ovens
 - 7. Core blowers
 - 8. Machines
 - a. Sand mixer
 - b. Rosin mill
 - c. Wire cutter and straightener
- B. Mixtures
 - 1. Ramming
 - 2. Rodding
 - 3. Wiring
 - 4. Venting
 - 5. Drying
- D. Assembling
 - 1. Cleaning
 - 2. Venting
 - 3. Jigging
 - 4. Daubing
 - 5. Blacking
 - 6. Gaging
 - 7. Pasting
 - 8. Inspecting

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I.—Simple Chemistry of Iron

- A. Metals
 - 1. Composition
 - a. Sulphur
 - b. Phosphorus
 - c. Silica
 - d. Carbon
 - e. Impurities
 - 2. Mixtures
 - 3. Alloys
- B. Acids, bases and salts
- C. Gases
 - 1. Oxidation
 - 2. Carbonization

II.—Structures of Metal

- A. Iron
 - 1. Semi-steel
 - 2. Gray
 - 3. Wrought
 - 4. Malleable
- B. Steel
 - 1. Kinds
 - a. Soft
 - b. Medium
 - c. Hard
 - 2. Chemical composition
 - a. Free
 - b. Graphitic
- C. Alloys
 - 1. Brass (yellow-red)
 - 2. Bronze
 - 3. Aluminum
 - 4. Nickel
 - 5. White metal

III.—Annealing Metal

- A. Structural changes
 - 1. Gray iron
 - 2. Malleable
 - 3. Steel

IV.—Hardening Metal

- A. Case hardening
- B. Tempering
- C. Chilling

V.—Composition of Sands

- A. Natural
 - B. Prepared

VI.—Mixtures of Sands

- A. Physical properties
 - 1. Porosity
 - 2. Shape of sand grains
- B. Chemical properties
 - 1. Burning out qualities

VII.—Simple Chemistry of Cores

- A. Sands
- B. Binders
 - 1. Oil
 - 2. Rosin
 - 3. Molasses
 - 4. Glutrin
 - 5. Compounds

VIII.—Simple Mechanics

- A. Strength of metal
 - 1. Tensile
 - 2. Compression
 - 3. Shearing
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 - 6. Elongation

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 - 2. Thermometers
- B. For strength
 - 1. Scleroscope
 - 2. Brinell machine
- C. For hardening
- D. For air
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- A. Method of melting
 - 1. Air furnace
 - 2. Electric furnace
 - 3. Open-hearth furnace
 - 4. Crucible furnace
 - 5. Reverberatory furnace
 - 2. Jacket or shell
 - 3. Design
 - 4. Chemical action of fuel
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 - 1. Linings
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 - 1. Liquid to molten
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I.—Interpreting Drawings

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- A. Devices
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II.—First Aid

III.—Health Hazards

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I.—Importance of the Foundry Industry

- A. Local
 - B. National

II.—Lines of Promotion

- A. Technical
 - B. Managerial

III.—Requirements of the Industry

- A. Minimum beginning age
 - C. Physical fitness
- B. Length of service
 - D. Training

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- A. Compensation
 - E. Seasonality
- B. Working conditions
 - F. Supply of workers
- C. Health and safety factors
 - G. Promotional opportunities
- D. Hours of labor

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- A. Materials
 - 1. Sand
 - 2. Clay
 - 3. Pig iron
 - 4. Coke or coal
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 - 6. Stores
 - B. Products
 - C. Patterns
 - 1. Care
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II.—Handling

- A. Materials
 - 1. Conveyors
 - 2. Trucks
 - 3. Cranes
 - 4. Tractors
 - 5. Motors
 - B. Products
 - 1. Conveyors
 - 2. Trucks
 - 3. Cranes
 - 4. Tractors
 - 5. Motors
- C. Patterns
 - D. Cores

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- A. Saving time

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- A. Orders
 - D. Equipment
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 - 2. Training
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Economics Side of Foundry Business

I.—Importance of Metal in Modern Industry

II.—Relation of Pig Iron Prices to Industrial Conditions

III.—Costs

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 - 2. Sales force
 - 3. Office expenses
- B. Transportation
- C. Labor
- D. Cost of management
- E. Factory costs
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- A. Nearness to supply of materials
 - D. Transportation
 - 1. Speed
 - 2. Cost
- B. Nearness to supply of fuel
- C. Nearness to market

VI.—Foundry Products

- A. Kinds
 - 1. Gray iron
 - 2. Malleable
 - 3. Steel
 - 4. Aluminum
 - 5. Alloy
 - a. Brass
 - B. Distribution
 - b. Bronze
 - C. Relation to other industries
 - D. Completeness of the product

Newell, Corse & McDaniel, 706 Otis Building, 810 Eighteenth Street, Washington, are continuing their consulting engineering business under the name of the Research Service, Inc. A Latin-American department has been established under the direction of Dr. Richard Muller, to handle hydroelectric development, irrigation, drainage, water supply and other utility projects. The company will handle matters pertaining to Washington representation, surveys, investigations and reports for business, industry and trade associations. F. H. Newell is president; W. M. Corse, vice-president and general manager, and A. B. McDaniel, secretary-treasurer.

Domestic sales of oak leather belting in December amounted to 343,443 lb., valued at \$598,965, or an average of \$1.74 per lb. This compares with 310,542 lb. in November, valued at \$543,448, or \$1.75 per lb., and with 324,263 lb. in December, 1924, valued at \$547,681, or \$1.69 per lb. The figures are reported by the Leather Belting Exchange from manufacturers representing about 60 per cent of the total product.

Exports Lower, December and Year

Total 2.4 Per Cent Below 1924—December 17 Per
Cent Under November—Imports
Much Higher

WASHINGTON, Jan. 25.—The outstanding feature of American foreign trade in iron and steel in 1925 was the enormous increase in imports. Making a gain to 943,240 gross tons during last year, as against 556,637 tons for 1924, the heaviest advance was made in pig iron. Incoming shipments of this blast furnace product in 1925 totaled 441,425 tons, as against 209,109 tons in 1924. Of the 1925 pig iron imports, 184,325 tons came from British India, while the United Kingdom ranked second as country of import of this product, with 75,052 tons.

Other sharp increases in imports in 1925 were re-

flected in ferromanganese, which increased to 75,724 tons, as against 47,922 tons in 1924; scrap, which increased to 99,815 tons, compared with 66,841 tons; structural shapes, which showed an increase to 77,293 tons, as against 43,244 tons, and tubular products, increasing to 82,864 tons, as against 54,469 tons. Of tubular products imported last year, 51,215 tons consisted of cast iron pipe, of which 42,444 tons came from France, while 6874 tons came from Belgium. December imports totaled 98,400 tons, of which 53,333 tons were pig iron.

As stated in THE IRON AGE of last week, exports of iron and steel in December amounted to 142,209 tons, while for the year 1925 they aggregated 1,762,571 tons, a decline of 42,582 tons under exports of 1924, when the total was 1,805,153 tons. Decreases for the year were reflected in exports of such lines as pig iron, scrap, semi-finished material, black steel sheets and steel rails. Substantial increases were made in exports of steel bars, plates, galvanized sheets, and tubular products.

Of the 1925 exports, Canada was easily the leading country of consumption, taking 614,661 tons, compared with 550,593 tons in 1924. Cuba ranked second, taking 146,823 tons, as against 165,637 tons in 1924; Japan dropped to third position, taking 132,674 tons, as against

Exports of Iron and Steel in Gross Tons			
	All Iron and Steel	Pig Iron	Semi-Finished Material
*Average, 1912 to 1914	2,406,218	221,582	145,720
*Average, 1915 to 1918	5,295,333	438,462	1,468,020
*Average, 1919 to 1923	3,078,724	123,837	149,218
January, 1924	247,942	3,812	8,594
February	164,820	4,773	11,463
March	123,618	4,047	2,278
April	131,276	4,117	8,275
May	154,136	4,317	4,895
June	163,770	2,057	11,178
Fiscal year 1924	2,009,343	40,596	119,744
July	137,481	1,796	10,363
August	134,628	4,365	6,127
September	135,979	4,799	15,473
October	157,071	3,373	15,569
November	123,577	1,478	8,649
December	128,865	2,549	7,081
Calendar year 1924	1,805,153	41,478	114,417
January, 1925	140,802	1,298	5,764
February	101,665	1,413	7,516
March	154,178	2,037	7,951
April	154,426	1,632	6,831
May	150,612	2,316	7,360
June	136,847	2,507	7,804
Fiscal year 1925	1,647,024	29,563	107,988
July	138,670	2,348	10,701
August	188,963	5,944	8,024
September	136,754	3,349	8,186
October	141,817	2,874	8,432
November	171,134	4,272	16,783
December	142,209	2,626	12,282
Calendar year 1925	1,762,571	32,674	108,681
*Calendar years.			

Imports of Iron and Steel in Gross Tons				
	Total Imports	Pig Iron	Ferro-alloys	Manganese Ore and Oxide*
January, 1924	26,675	10,587	3,033	23,081
February	42,269	15,482	4,847	4,430
March	39,278	16,919	3,941	46,067
April	50,969	17,171	7,371	29,729
May	66,801	25,220	5,501	31,993
June	60,569	28,697	2,347	24,726
July	30,410	13,511	1,435	12,287
August	44,928	16,189	1,120	16,160
September	45,214	16,347	3,578	6,269
October	49,873	19,963	8,608	12,088
November	35,707	9,880	7,596	19,919
December	69,281	28,143	10,530	28,305
Calendar year 1924	556,637	209,109	59,910	255,157
January, 1925	77,058	41,344	7,165	15,498
February	92,373	47,803	10,997	9,666
March	92,106	50,803	5,691	24,330
April	71,249	33,299	7,699	14,941
May	68,117	21,260	8,721	29,139
June	82,330	35,657	4,259	20,720
Fiscal year 1925	749,393	325,199	77,291	186,939
July	64,642	24,881	3,601	28,586
August	68,489	30,707	3,526	34,168
September	68,445	29,917	3,594	22,709
October	80,163	37,709	11,226	23,054
November	79,771	34,712	6,173	33,238
December	98,400	53,333	7,703	36,908
Calendar year 1925	943,240	441,425	80,269	265,688
*Not included in "total imports." These figures are for manganese contents of the ore.				

Exports of Iron and Steel from the United States				
(In Gross Tons)		Twelve Months Ended December		
	December	1925	1924	
Pig iron	2,626	2,549	32,674	41,478
Ferromanganese	40	...	5,496	3,165
Ferrosilicon	...	10	...	775
Scrap	3,705	5,771	82,573	97,447
Pig iron, ferroalloys and scrap	6,371	8,330	120,743	142,865
Ingot, blooms, billets, sheet bar, skelp	10,448	5,366	87,478	95,657
Wire rods	1,834	1,715	21,203	18,760
Semi-finished steel	12,282	7,081	108,681	114,417
Steel bars	9,859	5,942	111,948	98,380
Alloy steel bars	567	186	3,691	2,743
Iron bars	263	215	4,615	5,055
Plates, iron and steel	9,933	5,266	104,450	85,543
Sheets, galvanized	12,410	8,166	160,270	108,148
Sheets, black steel	11,357	7,592	95,431	148,742
Sheets, black iron	1,854	1,026	14,768	11,003
Hoops, bands, strip steel	4,055	2,988	40,933	34,141
Tin plate,terne plate, etc.	13,001	12,566	161,383	160,994
Structural shapes, plain material	9,640	7,586	104,339	102,408
Structural material, fabricated	6,954	11,701	73,460	70,784
Steel rails	4,820	23,198	151,690	208,829
Rail fastenings, switches, frogs, etc.	1,843	2,090	35,367	36,112
Boiler tubes, welded pipe and fittings	18,187	15,936	239,670	213,514
Plain wire	2,770	1,597	35,596	37,052
Barbed wire and woven wire fencing	5,873	6,557	71,115	90,443
Wire cloth and screening	197	75	1,951	1,628
Wire rope	315	252	4,369	4,186
Wire nails	944	861	9,837	21,664
All other nails and tacks	852	854	9,229	7,886
Horseshoes	85	44	706	963
Bolts, nuts, rivets and washers, except track	1,479	1,146	16,956	17,493
Rolled and finished steel	117,258	108,844	1,151,774	1,167,711
Cast iron pipe and fittings	2,858	1,631	32,193	29,051
Car wheels and axles	1,109	1,755	19,936	22,329
Iron castings	823	594	10,412	8,456
Steel castings	255	427	4,209	5,876
Forgings	109	203	2,170	1,716
Castings and forgings	5,154	4,610	68,920	67,428
All other	1,144	...	12,453	12,732
Total	142,209	128,865	1,762,571	1,805,153

277,204 tons, and Mexico was fourth, taking 102,412 tons, compared with 108,512 tons.

Of imports in 1925, British India took first place as country of origin, providing 185,349 tons; Belgium was second, with 168,990 tons; the United Kingdom was third, with 155,487 tons, and Germany was fourth, with 105,094 tons. Of steel bar imports in December, amounting to 6504 tons, 2469 tons came from France and 2430 tons from Belgium. Plain structural shapes imported in December totaled 3736 tons, out of total shape imports for the month amounting to 3798. Of the plain structural imports for the month, 2150 tons came from Belgium; 991 tons from the Netherlands and 474 tons from Germany.

Imports of Iron and Steel into the United States
(In Gross Tons)

	December		Twelve Months Ended December	
	1925	1924	1925	1924
Pig iron	53,333	28,143	441,425	209,109
*Ferromanganese	7,560	8,648	75,724	47,922
Ferrosilicon	143	1,882	4,555	11,988
Scrap	10,418	13,212	99,815	66,841
Pig iron, ferroalloys and scrap	71,454	51,885	621,519	335,860
Steel ingots, blooms, billets, slabs and steel bars†	1,635	2,628	27,083	39,021
Wire rods	656	612	7,989	6,849
Semi-finished steel ...	2,291	3,240	35,072	45,870
Rails and splice bars ...	244	3,758	36,871	43,357
Structural shapes ...	3,798	5,992	77,293	43,244
Boiler and other plates	24	22	818	3,276
Sheets and saw plates	455	336	3,663	2,788
Steel bars†	6,504	...	58,811	...
Bar iron	828	247	11,738	4,354
Tubular products	11,802	3,007	82,864	54,469
Nails and screws	210	22	2,758	351
Tinplate	55	31	383	1,036
Bolts, nuts, rivets and washers	1	11	105	164
Round iron and steel wire	243	158	4,053	3,277
Flat wire and strip steel	204	117	2,190	2,088
Wire rope and insulated wire, all kinds	122	264	2,127	13,654
Rolled and finished steel‡	24,490	13,965	283,674	172,058
Castings and forgings	165	191	2,975	2,849
Total	98,400	69,281	943,240	556,637
*Manganese ore	36,908	18,522	265,688	255,157
Iron ore	240,049	185,571	2,190,697	2,047,055
Magnesite	1,910	913	77,290	62,861

*Manganese content only.

†Steel bars have been reported separately from semi-finished products, in the Customs reports, only since Jan. 1, 1925.

‡This includes some cast iron pipe, under the heading "tubular products."

Imports of Iron and Steel into the United States in December, 1925, and During the Calendar Year 1925 by Countries
(In Gross Tons)

	December, 1925	Calendar Year, 1925
Austria	43	200
Belgium	8,992	168,990
Czechoslovakia	101	2,529
Denmark	5	71
France	10,857	86,539
Germany	13,263	105,094
Irish Free State	2	21
Italy	26	322
Netherlands	7,294	66,936
Norway	8	8,389
Russia	4,787	4,787
Spain	20	203
Sweden	2,984	31,911
Switzerland	1	169
United Kingdom	23,068	155,487
Canada	7,348	84,774
Mexico	22	1,420
Bermuda	1	126
Other British West Indies	123	253
Cuba	5,614	32,487
Chile	18	117
British India	13,553	185,349
Ceylon	5	43
China	1	263
Java and Madura	5	44
Other Dutch East Indies	2	1
Hongkong	11	301
Japan	1	89
Australia	244	1,653
Belgian Congo .....	...	4,669
All other countries .....	...	...
Total	98,400	943,240

Imports of Pig Iron and of Cast Iron Pipe into the United States, by Countries of Shipment
(In Gross Tons)

	Pig Iron		Cast Iron Pipe	
	December, 1925	Twelve Months Ended December, 1925	December, 1925	Twelve Months Ended December, 1925
British India	13,553	184,325	...	...
United Kingdom	20,148	96,869	...	90
Germany	9,200	75,052	...	...
Netherlands	6,075	54,904	...	9
Belgium	2,030	11,068	918	6,874
France	1,400	9,814	6,246	42,444
Canada	662	6,455	6	1,717
Sweden	266	2,169	...	...
Other countries .....	...	769	...	*81
Total	53,333	441,425	7,179	51,215

*Switzerland.

Sources of American Imports of Iron Ore
(In Gross Tons)

	December		Twelve Months Ended December	
	1925	1924	1925	1924
Spain	20	7,631	144,421	70,645
Sweden	20,324	39,674	141,324	310,436
Canada	494	258	7,829	4,122
Cuba	62,500	15,207	535,130	285,288
Chile	142,000	101,500	1,113,900	1,144,775
French Africa	13,075	19,107	173,070	192,814
Other countries	1,636	2,194	75,023	38,975
Total	240,049	185,571	2,190,697	2,047,055

Fewer Steel Barrels Produced in December

Production of steel barrels in December is reported by the Department of Commerce from 31 establishments at 467,485, compared with 498,929 in November and 553,545 in October. The December figure is considerably higher than that of a year ago, when the total was 413,785. Percentage of operation in December is reported by the Steel Barrel Manufacturers' Institute, Cleveland, as 41 per cent of capacity. The value of business for the month is given by the institute at \$1,164,423.

As for many months, shipments were close to production. Stocks at the end of the month, at 46,100 barrels, were the lowest since July. Unfilled orders at the end of December amounted to 1,745,346 barrels, much the largest figure in more than two years. It compares with 1,248,545 at the end of November and with 1,586,034 at the end of 1924. Of the current unfilled orders, 368,286 were specified for delivery within 30 days.

Production in the entire year showed a marked increase over 1924. The total for 1925 aggregated 6,046,654, while that for 1924 was 4,725,604. The gain was thus 28 per cent.

Industrial Activity Sustained in Pennsylvania

HARRISBURG, PA., Jan. 26.—The semi-monthly report of labor conditions in Pennsylvania to R. H. Lansburgh, Secretary of Labor and Industry, indicates rather encouraging conditions in the iron and steel trades, although some districts are experiencing slumps or seasonal lay-offs.

Pittsburgh finds no abatement in demand for workers of a number of classes. There is no large surplus of skilled mechanics in any class, although there is a surplus of helpers and men who do not quite fall within a skilled classification. At Johnstown industry has resumed its pre-holiday stride, and demands for help in many lines are steady. The steel car shops of the Bethlehem Steel Co. are reported very active.

Philadelphia reports two large seasonal lay-offs, one by an automobile body builder and another by a radio manufacturer. Reading finds little activity, except in brass, aluminum and stove foundries. Lay-offs are the rule in the Scranton district, as a result of the prolonged anthracite strike.

Improvement in British Prices

Pig Iron and Steel Show Recovery—Belgian Prices More Stable—German Conditions Unchanged

(By Cable)

LONDON, ENGLAND, Jan. 25.

CLEVELAND pig iron is strong and prices have advanced 1s. per ton. Domestic demand continues unabated and stocks on yards are negligible, but export inquiry is poor. Both domestic and export demand for hematite is well sustained and most makers are heavily booked. East Coast mixed numbers is quoted up to £4 for March delivery. Foreign ore continues quiet, with Bilbao Rubio quoted at 21s. 3d. to 21s. 6d., c.i.f. Tees.

Finished steel demand is improving, particularly for structural and engineering projects. New contracts for shipbuilding are small, but export inquiry is broadening. The London & North Eastern Railway's recent order for 33,000 tons of rails was distributed among the Beardmore Steel Co. of Scotland; Barrow Hematite Steel Co., Ltd., Lancashire; Cargo Fleet Iron Co., Ltd., Middlesbrough; Bolckow, Vaughan & Co., Middlesbrough; Cammell Laird & Co., Sheffield; Steel, Peech & Tozer, Ltd., Rotherham; Samuel Fox & Co., Sheffield, and the Partington Steel & Iron Co., Manchester.

Tin plate demand is improving and most supplies are at 19s. 3d. per base box, f.o.b. Some makers are asking 19s. 6d. and higher. Pooling by tin plate makers has not yet started. Eastern markets are inquiring for a total of 1,500,000 boxes of oil can sizes. Galvanized sheets are quiet and prices easier. Black sheets are active, particularly in the heavy gages. The light gages bought by Japan are quiet and easier in price.

Continental iron and steel markets are firm, with British users of semi-finished material keen buyers, but supplies scarce. Good sales of merchant bars are reported at £5 8s. 6d. and of plates at £5 10s., f.o.b., either domestic or export. The Charleroi workers are returning, although there has been no official settlement of the dispute. It is expected the Charleroi mills will be able to offer material in three to four weeks. The German Pig Iron Association is making no change in prices or payment conditions for February sales. The German Raw Steel Association is maintaining the February production of its members at 65 per cent.

BELGIAN PRICES FIRMER

Withdrawal of French Mills from Export Aids Prices—Charleroi Strike Nears End

ANTWERP, BELGIUM, Jan. 9.—The volume of business in the iron and steel markets continues small following the holiday decline in activity, but prices are fairly stable, although in general the market is still unsettled. It is apparently certain, however, that there will be no early recovery of prices. German competition is still strong; some makers, seeking to secure a good backlog of business, offer price concessions on desirable lots. Competition from French mills is also an important factor, although the largest French works are at present well booked with business and not offering the low-price competition of a month ago. In fact, nearly all

the important French mills are practically out of the market for export business. Belgian producers, while finding this situation extremely desirable, are not inclined to consider it as in any way permanent. It is pointed out that should the present efforts to bolster up the French franc succeed even in part, many of the orders now on the books of the mills would probably be canceled as too expensive to the domestic consumer and the mills would again enter foreign markets for tonnage.

The strike in the Charleroi district will probably be settled within the next few weeks as a recent compromise suggested by the operators is apparently meeting with the approval of the workers, who are returning to some plants. This will result in the return to the market of about 100,000 tons of steel capacity a month. Naturally prospective purchasers are watching developments in the Charleroi district with interest, as it is

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £, as follows:

Durham coke, del'd.,	£1 2s.	\$5.33
Bilbao Rubio ore,...	1 11½	5.21
Cleveland No. 1 fdy.,	3 12½ and 13 13s.*	17.57 and \$17.70*
Cleveland No. 3 fdy.,	3 10 and 3 10½*	16.97 and 17.09*
Cleveland No. 4 fdy.,	3 9 and 3 9½*	16.73 and 16.95*
Cleveland No. 4 forge	3 8 and 3 8½*	16.48 and 16.61*
Cleveland basic	3 10 and 3 10½*	16.97 and 17.09*
East Coast mixed	3 17 to 4 0	18.66 to 19.40
East Coast hematite	4 19	24.00
Ferromanganese	15 10	75.18
*Ferromanganese	15 5	73.96
Rails, 60 lb. and up.,	7 10 to 8 0	36.37 to 38.80
Billets	6 0 to 7 10	29.10 to 36.37
Sheets and tin plate,		
bars, Welsh	6 5	30.31
Tin plates, base box	0 19½ to 0 19½	4.63 to 4.72
C. per Lb.		
Ship plates	7 2½ to 7 12½	1.54 to 1.65
Boiler plates	11 0 to 11 10	2.56 to 2.67
Tees	7 7½ to 7 17½	1.59 to 1.69
Channels	6 12½ to 7 2½	1.43 to 1.54
Beams	6 7½ to 6 17½	1.38 to 1.48
Round bars, ¾ to 3 in.	7 17½ to 8 7½	1.67 to 1.81
Steel hoops	10 10 and 11 0*	2.27 and 2.35*
Black sheets, 24 gage	11 5 to 11 10	2.44 to 2.67
Black sheets, Japanese		
specifications	15 5	3.30
Galv. sheets, 24 gage	16 5 to 16 10	3.51 to 3.57
Cold rolled steel strip,		
20 gage	18 0	3.90

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

Foundry pig iron:(a)				
Belgium	£3 1s.	to £3 4s.	\$14.79	to \$15.52
France	3 1	to 3 4	14.79	to 15.52
Luxemburg	3 1	to 3 4	14.79	to 15.52
Basic pig iron:(a)				
Belgium	2 19	to 3 0	14.30	to 14.55
France	2 19	to 3 0	14.30	to 14.55
Luxemburg	2 19	to 3 0	14.30	to 14.55
Coke	0 18		4.37	
Billets:				
Belgium (Nom.)	4 11½	to 4 12½	22.18	to 22.32
France (Nom.)	4 11		22.06	
Merchant bars:				
Belgium	5 8	to 5 10	1.17	to 1.19
Luxemburg	5 8	to 5 10	1.17	to 1.19
France	5 8	to 5 10	1.17	to 1.19
Joists (beams):				
Belgium	5 0	to 5 2½	1.08	to 1.10
Luxemburg	5 0	to 5 2½	1.08	to 1.10
France	5 0	to 5 2½	1.08	to 1.10
Angles:				
Belgium	5 2	to 5 4	1.12	to 1.15
1½-in. plates:				
Belgium	6 0	to 6 5	1.32	to 1.35
Germany	6 2½	to 6 5	1.34	to 1.35
¾-in. ship plates:				
Belgium	5 10	to 5 12½	1.19	to 1.20
Luxemburg	5 10	to 5 12½	1.19	to 1.20
Sheets, heavy:				
Belgium	6 3	to 6 4	1.33	to 1.34
Germany	6 3	to 6 4	1.33	to 1.34

(a) Nominal.

expected that considerable concessions in price will be made by Charleroi mills to secure a backlog. At the same time other Belgian mills are slightly behind on production schedules as a result of the recent floods in the Liège district.

Pig Iron.—Stocks on yards are small and the demand is improved, although prices show but little change. Phosphorus foundry iron, No. 3, 2.50 to 3.00 per cent sil., is quoted at 330 Belgian francs, about \$15 per metric ton, f.o.b. Antwerp. Export demand, however, is light, as the price is slightly high to compete with iron of the same grade in foreign markets. Semi-phosphorus foundry iron is quoted at \$18 per ton, f.o.b. Antwerp, and hematite of Bessemer grade has been sold at \$18.50 to \$19 per ton, f.o.b. Antwerp.

Semi-Finished Material.—There is a wide difference in the current quotations of various makers on billets, blooms and slabs. Although there is a moderate volume of inquiry, actual business is small. British buyers are making offers, which are much too low despite the tonnage involved in their inquiries. Billets are scarce and range in price from £4 8s. to £4 9s. (\$21.34 to \$21.58) per metric ton. Demand for blooms is small and quota-

tions show some weakness at £4 1s. to £4 3s. (\$20.10 to \$20.58) per metric ton. Sales of slabs have been made to £4 13s. (\$23) per metric ton, although the market is generally considered as £4 13s. 6d. to £4 14s. (\$23.10 to \$23.25) per metric ton, f.o.b. Antwerp.

Finished Material.—The market is rather quiet but prices are well maintained. Export business is extremely light with the exception of purchases by Japanese consumers, buying material for arrival before the expected application of higher duties in March or April. Bar business has been light with small sales at £5 6s. and £5 7s. per ton, f.o.b. Antwerp. Lorraine mills are mostly out of the market and Luxembourg makers are quoting higher prices. Charleroi mills have booked some business at 106s. (\$38.75) per metric ton, f.o.b. Antwerp on three to four weeks' delivery. Beams continue unchanged at £4 17s. to £4 17s. 6d. (\$23.96 to \$24.05) per metric ton. Export business in angles has been light and quotations are not particularly firm at £5 5s. 6d. to £5 6s. (\$25.58 to \$25.70) per metric ton, f.o.b. Antwerp. Corrugated bars are generally quoted at £5 12s. per metric ton, \$27.15. The market on wire rods is about £5 15s. per metric ton, \$27.95.

GERMAN OUTPUT DECLINES

Foreign Trade Held at Expense of Prices—Demand for Higher Tariff—More Cartels

BERLIN, GERMANY, Jan. 6.—For most mills, December was about the worst month of 1925 and thus far the iron and steel markets show no improvement. The usual winter depression is more pronounced than in previous years; the first fortnight of December brought an increase of nearly 60 per cent in the unemployed, a total of more than 1,000,000 and the number in the first week of January is estimated at close to 1,400,000 unemployed.

Iron, steel and coal stocks are generally less than half and in some instances less than a third the high levels of 1925, but in the past few days there have been a few signs of improvement. Foreign trade in November was greatly improved. Prices have apparently reached bottom and wages continue to increase. The average wage in the steel industry in November was 46 marks compared with 45 marks in October and only 36.8 marks in January of last year.

Negotiations for the formation of the Western Steel Trust continue to hold the interest of the steel industry. Judged by conservative reports of the progress being made, success is almost certain. Reports of American participation in the new trust have not been taken seriously, but it has been established that American financial aid probably to the extent of \$50,000,000 will be secured. [Dillon, Read & Co., New York, Jan. 26 offered \$25,000,000 7 per cent bonds for three of the companies in the merger.] The question of participation quotas has been provisionally settled by giving a 39½ per cent share instead of the 40 per cent demanded to the three Rhine-Elbe corporations; Deutsch-Luxemburgische Bergwerks A. G., Gelsenkirchener Bergwerks and Bochum Steel Co.

More Cartels in Formation

A wire syndicate with headquarters at Düsseldorf has been formed and was recently extended to include 36 companies originally out of the association, so that the only manufacturers not in the syndicate are a number of small works producing less than one-half of one per cent of the total output of wire. A Zinc Ware Syndicate with headquarters at Düsseldorf has also been formed and negotiations have been about concluded for the formation of a rivets syndicate, the only remaining obstacle being the inclusion of certain Silesian works that are not inclined to join. Reports of the re-establishment of the International Rail Syndicate, in existence before the war, were evidently premature. Negotiations for an international tube syndicate are also delayed.

Sales of pig iron in December were the lowest in several years. The Pig Iron Syndicate has announced the continuation of the December quotations for January business. Based on the present volume of business being placed, it is estimated that about 10 per cent of the furnaces in blast now will be blown out before the end of January. French competition for pig iron business is still keen. Although the syndicate is maintaining the 35 per cent reduction of output for January, the actual reduction by member companies is placed at nearer to 40 per cent.

Business conditions are so bad in Upper Silesia that a number of mills have threatened to close entirely, which would involve the laying off of about 15,000 workmen. In the shipbuilding industry, however, there has been some slight improvement. The Hamburg-American and German-Australian lines have placed some shipbuilding contracts but some of the largest ship yards continue in financial difficulties. Siemens & Halske A. G. recently booked a considerable order for cables from Belgian sources.

Sales of High-Grade Steel to Britain

There has been an increase in export sales of high-grade steel products from the Solingen district, as a result of anticipation of the new British tariff. The Solingen Steelware Syndicate, established in 1923, disbanded and a new organization including 25 companies in its membership is planned, to be known as the Solingen Special Steelwares Sales Syndicate. Its function will be the purchase and resale of products from such of its members as are forced to sell to realize cash.

Although the steel syndicate's official prices have not been changed, except for one or two products, in the past two or three months, sales are, as a rule, considerably below the minimum official schedule. The practice of the syndicate of granting price rebates to manufacturers converting material into products for export has been extended to high-grade thin sheets. The rebates for January are: Ingots, 10 m.; blooms and billets, 15 m.; structural shapes and bars, 22 m.; gas tubing, 22 m.; electrical sheets, 22 m. The rebates have been doubled in some instances, since the system was introduced last summer, the increase representing the greater difference between German and the French and Belgian prices.

As a result of this divergence in prices of German and the French and Belgian mills, caused by the weakness of the franc, demand for anti-dumping legislation in the form of tariff increases is continuing. The result of this so-called "exchange dumping" is to keep German prices in many cases below actual production costs. Counter-dumping by German mills, however, is maintaining a steady improvement in the trade balance on iron and steel.

Forecasting Machine Tool Orders

Practical Method Used by One Manufacturer to Warn
of Changes in Sales Trend

BY ERNEST F. DUBRUL*

THE method of forecasting sales volume by means of a more or less regular relation between business pending (as indicated by quotations) and business secured will be found useful in many lines other than that of machine tool building. Mr. DuBrul points out that combined statistics from several companies might be much more accurate as an indicator than individual figures. On the general principle that increasing statistical data reduce probability of error, this is undoubtedly true. It is worth noting, however, that in the case of

quotations, the factor of duplication becomes tremendously involved; many buyers asking for bids from ten to twenty sellers before making out an order. Would such a multiplication of quotations be more accurate as a sales indicator than the non-duplicated quotations of the individual seller? This is a question which each manufacturer will do well to consider in relation to the conditions in his particular industry. Meanwhile, a group approach to the problem would certainly be useful and profitable.

JUST now when we may be quite close to the crest of a cycle, it is very important to forecast the trend of orders and to use every sound means for doing it. Our curve of orders booked† tells only half the story.

We have recently been given a full insight into a trick which one keen manager uses, to good effect. Such a forecaster would be invaluable to any executive in planning production and financial policies.

Before users place orders they get quotations on the tools they contemplate buying.

As the quotations precede the orders by some time, a record of the dollar volume quotations, reduced to a chart, forecasts the trend of the orders that follow later, as anyone can see. Therefore this company records every quotation made either direct or by its dealers, for machines of its production. This record is made by classes of tools and is used in various ways, but the sum of all the quotations is the thing that forecasts the trend. These monthly figures are plotted on a chart where the volume of orders is also plotted. The logarithmic scale is the best to use, for various reasons.

*General manager, National Machine Tool Builders' Association, Cincinnati.

†Issued by the National Machine Tool Builders' Association to its members.

Of course no concern gets an order from every quotation made, so that the line showing volume of quotations made will always be higher on the chart than the line showing volume of orders received.

As the turn in trend of quotations anticipates the turn in trend of orders, the quotation line would make a fair forecaster just from that fact. But there is a way of forecasting even the turn in the trend of quotations.

This is done by taking the ratio obtained by dividing quotations made by orders received. On the up-swings, when volume of quotations rises faster than that of orders, this ratio rises. Later, while quotations may continue to rise, the rate of rise in orders is faster than the rate of rise in quotations, so that the ratio diminishes before the quotations have actually turned downward. Plotting this ratio on the same chart gives a forecast still further ahead than the quotations alone can give.

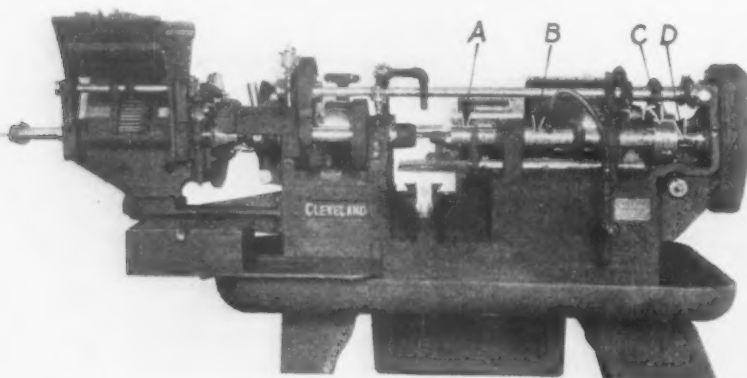
Now, while this is good, as far as it goes for one company, it can be made better by combining experience, to as full an extent as possible. Any one company's business is too irregular from month to month to give its executives the picture of the drift that is carrying it along with the whole industry.

Lead Screw Control for Cleveland Automatics

A lead screw mechanism for use on its automatic screw machines and claimed to permit the cutting of screw threads with a lead of high accuracy has been developed recently by the Cleveland Automatic Machine Co., Cleveland. This device, in combination with change

gears, is intended to provide for the rapid production of a range of precision threaded work.

The lead screw arrangement, together with a magazine feed mechanism for handling cylinder head studs, is shown in the accompanying illustration of the company's model B stud machine, this combination being stressed as assuring large output as well as unusual accuracy of the lead of the threads. With minor modi-



Automatic Screw Machine With Lead Screw Mechanism and Magazine Feed for Handling Studs. The lead screw device permits cutting threads with lead of high accuracy

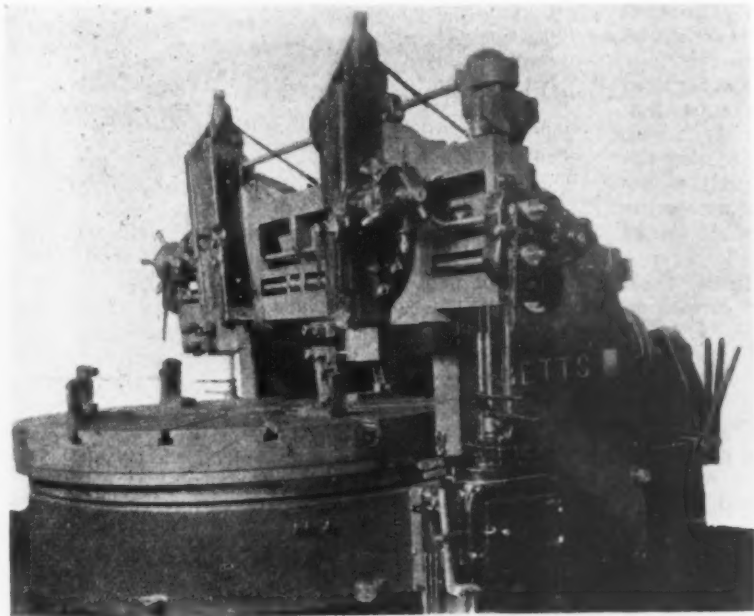
fications the same arrangement can be applied to other sizes of the company's model B automatic for a wide range of forms and sizes of work. It will be noted that threading die *A* is carried on tailstock spindle *B*. To the rear end of the spindle *B* there is secured the split nut carrier *C*, which carries split nuts engaging the lead screw *D*. The split nut carrier *C* moves backward and forward as the spindle *B* advances die *A* to the work and withdraws it after the threading operation has been completed. By transposing change gears, threads of any desired pitch may be cut.

When spindle *B* has advanced die *A* to the work through the customary cam mechanism, a cam closes nut *C* onto the lead screw *D*. Rotation of this screw by the change gears then causes nut *C* and spindle *B* to feed the die onto the work. After the threading has been completed the die is automatically tripped. At the same time action in the split nut carrier *C* withdraws the half nuts from the lead screw, thus permitting the tailstock spindle *B*, with the die *A* and nut *C*, to be returned to the starting point. Patents on the device are pending.

Improved Locomotive Tire Boring and Turning Mill

An improved vertical tire mill for boring and turning steel locomotive tires, developed recently by the Betts works of the Consolidated Machine Tool Corporation of America, Rochester, N. Y., is here illustrated. Although rated as a 96-in. machine, the mill shown has

Improved Features Include Narrow Guide Crossrail, Power Rapid Traverse to Saddles and Tool Spindles Driven by Independent Motor



a swing of 100 in. Machines of similar design have been built in 66-in., 72-in., 84-in. and 108-in. rated sizes.

Compared to Betts tire mills of earlier design, improved features include a narrow guide crossrail, power rapid traverse to the saddles and the tool spindles driven by independent motor. It has continuous feed with eight changes through sliding gears, speed change gears fully inclosed and running in oil. The speed change gear box is built into bed at rear of machine between the uprights.

The table is equipped with a four-jaw universal chuck for centering the tires. The application of a wrench at any one of the jaws causes all jaws to move inward, thereby automatically centering the work. Each jaw is provided with a special eccentric hold-down clamp for use when boring. The clamps are arranged so that they may be tilted backward to permit the ready removal of tires. Special heavy-duty clamps are used in connection with the universal chuck for withstanding thrust of form tools in turning threads.

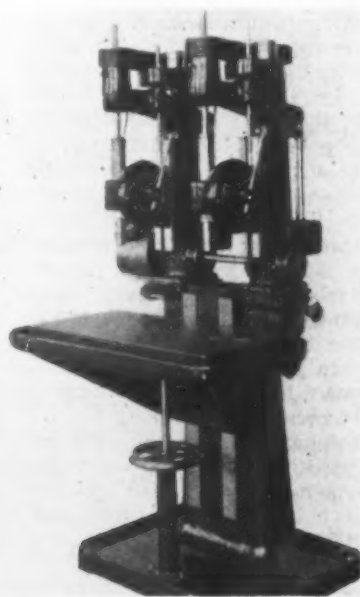
The machine is designed for extremely heavy duty.

All driving and feed gears, as well as saddles and tool spindles, are of steel. The tool spindles are of heavy rectangular section and are carried in swivels having square guides throughout. The crossrail is of wide face. It has no vertical adjustment, but machines of similar design are built with movable crossrail for shops requiring more room under the tools. Feed and power rapid traverse may be engaged, disengaged and direction reversed, by means of two levers located conveniently just above each feed box. The table is of unusual depth and is driven by steel internal gears of large diameter, wide face and coarse pitch. Alemite lubrication is provided for the main bearings.

Drilling Machine for Manufacturing Use

A simplified drilling machine, designed by the Taylor & Fenn Co., Hartford, primarily for manufacturing purposes and available with from one to seven spindles is here shown.

The machine illustrated is the No. 32 and is equipped with power feed. The heads are adjustable on the column and are ball bearing throughout. The spindle speeds may be varied from 575 to 2300 r.p.m. by changing the spindle and rear shaft pulleys. With a 6 $\frac{3}{4}$ -in. spindle pulley and 3 $\frac{3}{16}$ -in. rear pulley the spindle speed is 575 r.p.m. and by reversing these



Spindle Speeds May Vary from 575 to 2300 R.P.M. by Changing the Spindle and Rear Shaft Pulleys. The power feed increases when spindle speed is reduced. The machine is available with from one to seven spindles

pulleys a speed of 2300 r.p.m. is obtained, the speed of the driving pulley being 1150 r.p.m. in both cases. Unless otherwise specified, the machine is provided with two pulleys only, to suit particular requirements of the work to be done.

The power feed is variable, and increases automatically as the spindle speed is reduced, the maximum feed being 0.006 in. and the minimum feed 0.003 in. per revolution of the spindle. Slight pressure of the drill against the work serves to engage the power feed, which can be quickly disengaged, if required, before the full depth of the hole is reached by lifting the hand lever. Provision is made for locking the power feed when it is necessary to feed by hand. The stop is positive and the total travel of the spindle is made by one revolution of the lever.

For motor drive an adjustable motor bracket is attached to the column of the machine. A 1 to 1 $\frac{1}{2}$ -hp. motor is required for the one and two-spindle drill; a 1 $\frac{1}{2}$ to 2-hp. motor for the three or four-spindle unit and a 2 to 3-hp. motor for the five, six or seven-spindle

machine, the speed of the motor being 1150 r.p.m. The oil system includes a pump, tank, piping, feed tubes and valves.

The spindle traverse is $5\frac{1}{2}$ in. and the adjustment of the spindle bracket is 7 in. The spindle nose is $1\frac{3}{8}$ in. in diameter and the spindle is bored to receive a No. 2 Morse taper. The distance from spindle to column is 8 in. and the maximum distance from spindle to the table is 25 in. The width of the table surface is 16 in. and the length is from 16 to 64 in. in the single-spindle and seven-spindle machine, respectively. The vertical adjustment of the table is 15 in. The net weight of the No. 1 machine is approximately 755 lb. and of the No. 7 drill, 3060 lb. To these weights 75 lb. should be added for each power feed head, 20 lb. for each tapping head, 50 lb. for the motor bracket and 120 lb. for the oil system.

Spacing Table for Use in Connection with Punching Machine

Simplicity and accuracy are outstanding features claimed for hand-operated spacing table illustrated, which has been introduced by the Stiening Spacing Machine Co., 1016 Empire Building, Pittsburgh. The machine is of the triple-pass type, used in connection with a large multiple punch and arranged to handle plates, angles, beams, columns and other structural shapes for web punching. One pass of the table may be arranged with adjustable rollers thereby allowing the table to be used both for web and flange punching. As there is no direct connection between table and punch, the table can be set up for use in connection with a punch already installed.

The template on this machine is of the permanent type, made of high-carbon steel and designed to accommodate hardened steel template pins. The set-up is accomplished by inserting template pins at the required spaces. This arrangement is stressed as permitting quick set-up and eliminating the necessity of making a separate template for each job, which allows the machine to be effectively used even when only a few duplicate pieces are to be punched. The template arrangement is such that fractional spacings of sixteenths may be obtained.

The material after being loaded on the trailer table is gripped by means of quick-acting gripper carried on the spacing carriage, the gripper being designed to permit holes to be punched close to the end of the material. The trailer carriage is equipped with lever-operated gripper which releases near the end of spacing and is used only when punching plates. Other materials are gaged at the punch and need not be held by the trailer gripper. A device is provided to facilitate centering of the plates before they are gripped.

The spacing carriage, which feeds the material, is manually controlled by the operator, who propels it

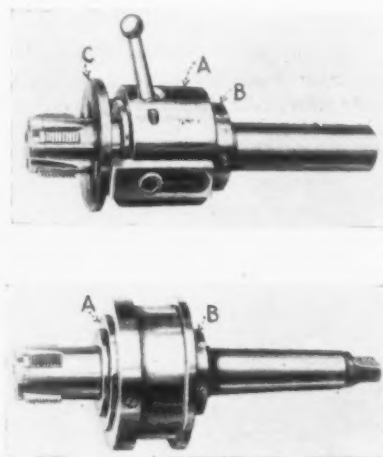
by means of large handwheel. The travel of the carriage and material is arrested against the template pins, thus assuring a positive, accurate spacing. After the punching operation the operator disengages the template dog by means of lever located near handwheel, and then feeds the material until the dog engages the next template pin. The spacing carriage is equipped with a multiple number of template dogs, which allow for entirely different series of spacings to be set up on the template at the same time. This feature permits the complete punching of an angle having different spacing of holes in the two legs without resetting the template or without removing the angle from the table. The handling of the material is thus reduced to a minimum.

New Adjustable Collapsing Tap

The Geometric Tool Co., New Haven, Conn., is placing on the market a new adjustable and collapsing tap which is available in four classes, designated as S, SA, SB and SC, respectively.

The class S tool, here shown, is of hand machine type, having a closing handle and trip plate. Contact

The Class S Tap Is Pictured in the Upper View and the SB Tool in the Lower. The closing sleeve is shown at A, the adjusting ring at B, and the trip plate at C.



with the work at the required time collapses the chasers; resetting is done by hand. The class SA is of rotary type with plate trip and is the same as class S, but without the closing handle. Contact with the work collapses the chasers, and contact of the closing sleeve resets the tap. The third class, designated as the SB, is of rotary type with flange trip, and is also the same as the class S tool except that it has neither the closing handle nor the trip plate. In this tool a flange is fitted over the closing sleeve for collapsing and resetting the tap. The SC tap is of hand trip type. It has no trip plate and is opened and reset by means of the handle.

It is stated that any of these four classes of collapsing taps may be converted into the other at little



Spacing Table of Triple Pass Type. One pass of the table may be arranged with adjustable rollers to permit of both web and flange punching. The template used is of the permanent type and is designed to accommodate hardened steel template pins.

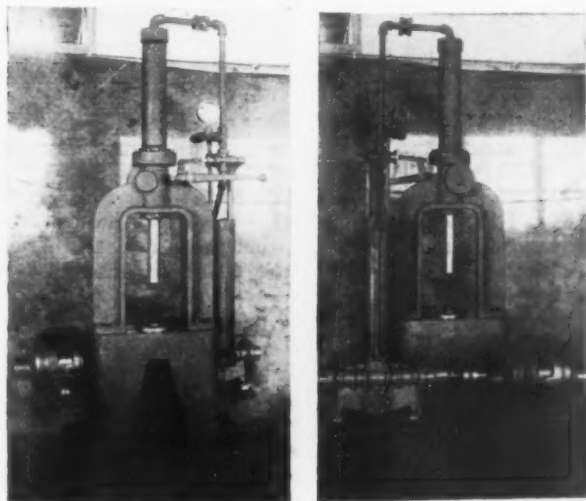
or no expense. Thus one tap with slight changes can be used on hand or automatic machines, and can be changed from plate trip to flange trip or vice versa, as well as to hand trip. They are made in sizes ranging from $\frac{3}{4}$ in. to $3\frac{1}{2}$ in. inclusive.

Simplicity of construction and operation, and compactness are general features stressed. The front end of the tap is of large diameter which is claimed to increase the strength and chip clearance grooves milled in front of the chasers are intended to prevent packing up of chips and to permit the chasers to cut freely. The tool is of alloy steel, hardened and ground, and is inclosed for protection against dirt and chips. A left-hand skeleton is required for left-hand tapping.

The chasers used in the four classes of S taps are interchangeable but not interchangeable in the company's class NL or class H taps. The chasers are of sturdy design and because of their thickness are said to have long grinding life. Short length is a feature stressed as lending strength to the front end of the tool under the torsional stress of tapping. They are of sufficient length, however, for any standard pipe thread. The chasers are supported for their full length, which provides a bearing under the cutting point, and may be removed simply by removing the cap on the front of the tool.

Hydraulic Press for Broaching, Assembling and Other Operations

The V-18 vertical broaching, assembling and straightening press of the American Broach & Machine Co., Ann Arbor, Mich., which was described in THE IRON AGE of May 24, 1923, is now available with hydraulic drive. The machine is equipped with a constant-flow pump, hydraulic cylinder and throttle valve, the latter being controlled by a lever by means of which the speed of the working stroke of the ram may be



Broaching, Assembling and Straightening Press Arranged for Hydraulic Operation. The mounting of the twin-screw pump may be noted from rear view at the right

varied from 0 to 16 ft. per min. The capacity of the machine is from 6 to 8 tons.

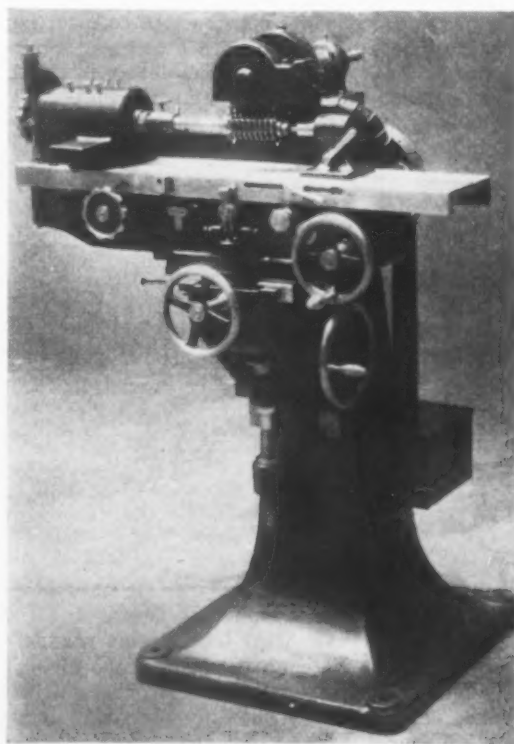
The pump is of twin-screw type, having two rotating members which are submerged in oil, and its simplicity of construction is stressed as making for long life. There are no packing glands under high pressure. A 5-hp. 1750-r.p.m. motor is employed to drive the press. The machine is arranged so that the ram is returned by means of springs to its upper or starting position automatically at the end of each operating stroke, which provision eliminates the necessity of reversing the machine at the end of each operating stroke. The relief valve on the machine can be set so that the pressure required for the particular work will not be exceeded, a feature stressed as of advantage in assembly operations where bushings and other parts

are being pressed into place. Stops are provided for controlling the length of stroke.

The ram is $2\frac{1}{2}$ in. in diameter, and its end is tapped 2 in. 8 pitch to receive the usual connections used on the horizontal machines. The stroke of the ram is 18 in. The diameter of the cylinder is 4 in. The table of the machine is bored central with the ram, the hole being 5 in. in diameter. An indicating gage reading in pounds and tons is provided to permit noting the pressure under which the machine is operating. A pump for supplying coolant to the work while broaching is part of the regular equipment and foot-treadle control can be furnished if desired. The machine occupies a floor space of approximately 5 ft. square, and the weight is 1900 lb.

Automatic Hob Grinder

Simplicity, high accuracy and rapid operation are claimed for a new Schuchardt & Schutte automatic hob grinder which is being placed on the market in the United States by George Scherr, 142 Liberty Street,



Both the Travel of the Table and the Indexing of the Hob Are Automatic. The table is arranged to swivel 15 deg. right or left

New York. The table of the machine travels back and forth automatically and the indexing of the hob is automatic as well. All the operator has, therefore, to attend to is to feed the tooth of the hob toward the grinding wheel from time to time. It is stated that one operator can handle several machines and that an unskilled operator can be trained easily to handle the grinder.

The arrangement of the machine may be noted from the illustration. The knee is adjusted vertically by means of a hand wheel, the adjustment of the cross slide being likewise by hand. The movement of the table may be either automatic or by hand wheel. The automatic travel is engaged by means of a coupling pin in the table gear box, and by withdrawing this pin the automatic table travel is tripped. The length of the table travel is controlled through adjustable stops.

As the table moves back and forth the hob automatically receives a slight rotating motion, corresponding with the spiral lead of the gash. This motion is controlled by a square guiding bar which is set by degrees to the exact helix angle of the gash. The table is arranged to swivel 15 deg. right or left to take care of right- and left-hand spiral flutes. The graduation is in $1/6$ deg., or 10 min. When straight fluted cutters

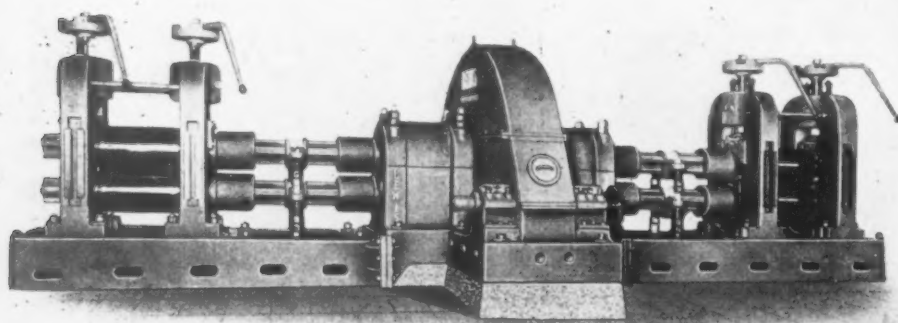
are to be ground the guiding bar is set to zero. The spiral indexing head is of new design, and is said to be highly accurate and simple to operate. The indexing is done by means of dividing plates, and one plate is suitable for a number of different divisions. The feeding of the cutter toward the grinding wheel is done by hand wheel and having the cutter fed radially toward the wheel is claimed to avoid distortion of the profile shape. The grinding spindle runs in ball bearings. A dust exhaust system which deposits the grinding dust in a water tank is provided.

The machine is built in two sizes to accommodate hobs up to 6¼ in. and 9¾ in., respectively, in diameter. It can be furnished for either belt or motor drive.

Duplex Rolling Mill

For rolling sheets and strips, the Lewis Foundry & Machine Co., Pittsburgh, has designed the new duplex mill illustrated here. Several sizes are made, with both single and double reduction drives. Advantages of this design of mill are found in the elimination of excess friction in the drive; rigid construction to insure operation without loss of time due to breakage; minimum floor space, without sacrificing accessibility in changing rolls; and economy of operation and upkeep.

Power is transmitted through the medium of Lewis



By Mounting the Driving Gears Between the Two Mill Stands, Alinement Is Improved. Rigidity is obtained by the heavy bases firmly keyed and bolted together

cut herringbone steel gears, by a single or double reduction, and a flexible coupling between motor and drive. The drive base, with both pinion stands and main bearings cast integral, is made in one piece; and securely bolted and keyed thereto are the mill bases. This construction insures not only maximum rigidity, but mill alinement. The main gear cover and pinion caps are made oil tight, and all pinions are forged steel. A complete sight-feed gravity oiling system is a part of the equipment and essential to smooth operation and control of oil flow. For attachment of any type of bridling or coiling apparatus, the roll housings are provided with tee slots on both sides.

Hardening High-Speed Roughing Tools

Since the discovery some 20 years ago of the benefits derived by subjecting certain chromium-tungsten or so-called high-speed steels to exceedingly high temperatures in hardening, much discussion has centered upon the best procedure and equipment for this heat treatment, says the *Technical News Bulletin*, United States Bureau of Standards. There are still those who advocate hardening from a forge fire. They claim superior performance for tools so treated in comparison with tools hardened from gas, oil-fired or electric furnaces.

Some roughing lathe tool tests were recently made at the bureau to determine whether or not such claims were justified. It was found that comparable performance was obtained when tools were raised to approximately equal temperatures for equal times in hardening. The forge-fire method of treatment has certain advantages, but there was no evidence of a mysteriously beneficial effect produced by contact between the tools and carbon of the fuel as has been claimed.

Unifying of American and British Screw Thread Systems

The British Engineering Standards Association has been invited by the American Engineering Standards Committee and the National Screw Thread Commission to a conference, to be held in April, to consider the possibility of unifying the American and British screw thread systems. Invitations to the conference have also been issued to the Canadian and Australian national standardizing bodies.

Both the American and the British systems of screw threads have been the result of a long national development, the basis for the American system having been laid by William Sellers in 1864, and that for the British system by Joseph Whitworth in 1841. The standard threads are called "American (national) standard thread" in this country, and "British Standard Whitworth (BSW) thread" in Great Britain. In the number of threads per inch for the various diameters, the two national systems correspond to a large extent; in fact, considering the American series of standard coarse threads, there are only two cases in which the British have a number of threads different from that adopted by the Americans for the same diameter. These cases are the ½-in. bolt, for which the Americans have adopted 13 threads per inch, against the British 12, and the 3-in. bolt, for which these figures are 4 and 3½ threads per

inch, respectively. A fundamental difference between the two national systems exists, however, with regard to the angle of thread, which is 60 deg. for the American and 55 deg. for the British thread. Another difference, of less importance, is that the American thread has flattened crests and roots, whereas those of the British are rounded.

The importance of a possible unification between the two screw thread systems will be obvious upon consideration of the innumerable applications of threaded parts in modern manufacture. One large company, for instance, use 20,000,000 ½-in. bolts alone in its annual production of machinery and equipment. The use of smaller bolts is on a still greater scale. By unification an enormous number of threaded parts would become interchangeable on an international scale.

No final decision in the matter will be taken by the conference, however, until after the problem has been considered in a general international meeting to which all of the 20 existing national standardizing bodies will be invited. The Whitworth thread, though originating in England, is used to a great extent and has been adopted in several other countries, which are therefore directly interested in the outcome of the discussions of this subject.

More Stokers Sold in December

WASHINGTON, Jan. 22.—Reports from 13 establishments to the Department of Commerce show that mechanical stokers sold in December, 1925, totaled 108, with 47,104 hp., as against 76, with 33,461 hp., in November. The December figure was almost at the year's average of 46,111 hp. per month.

Rating the Capacity of a Blast Furnace

Southern Ohio Pig Iron and Coke Association Discusses Method of Allowing
350 Operating Days Per Year

BASED on the assumption that a blast furnace lining should last four years and that a 60-day period would be required for relining and general repairs, the conclusion is that the annual capacity of each stack should be figured by multiplying the daily rated capacity by 350 operating days.

Such was the rule adopted by the Southern Ohio Pig Iron and Coke Association at its meeting in Ashland, Ky., on Jan. 20. The formula for determining the daily rated capacity is to be that set up by the association in October, 1920, for the grade of iron which a stack regularly produces. It states that a furnace should burn 60 lb. of coke per cu. ft. of working volume each 24 hours and that the working volume is to be measured as the volume from the center line of tuyeres to a point 2 ft. below the bell when closed. The coke should have 89 per cent fixed carbon, less than 1 per cent sulphur, between 9 and 10 per cent ash and between 1 and 2 per cent volatile matter. It should be tough, free from breeze, but neither dense nor fragile.

In discussing daily capacity the association in 1920 recognized the fact that "regardless of the grade of pig iron produced, blast furnaces of modern construction should burn about the same amount of fuel daily under the same operating conditions. For each grade of pig iron the tonnage that can be produced will depend upon the quality of the fuel used, the yield of ore mixture and blast temperature."

Determination upon 350 days as the average yearly production period for a blast furnace was made by the members of the association immediately following a recommendation to that effect by the committee on furnace ratings of which C. R. Peebles, Engineering Service Co., Ashland, is chairman. The committee acted upon the suggestion of H. A. Berg, vice-president Arthur G. McKee & Co., Cleveland, a member of the committee, who had read a paper on some of the factors affecting the annual capacity of a blast furnace.

The outstanding development in blast furnace operations in recent years, according to Mr. Berg, is the enormous increase in average daily production. Fundamentally few, if any, revolutionary changes have been made in the blast furnace process itself or in the equipment used in handling the materials to and from a furnace, but astounding results have been obtained through intelligent study and execution of details, the realization of the importance of proper assortment, preparation, proportioning and handling of all raw materials, the speeding up and improvement of equipment, the proper designing of furnace lines, the providing for and usage of higher blast temperatures, the careful attention to distribution problems and the introduction of automatic machinery.

Performance Per Lining

The enormous individual productions from blast furnace units are of such recent accomplishment that it is impossible to conclude through records that they will be accompanied by corresponding record tonnages on the life of one lining, said Mr. Berg. Tabulation of figures representing 60 furnaces of 22 different companies situated in various sections of the United States, and representing 12 different makes of brick, gives an average of 707,000 tons, the highest being 1,337,087 and the lowest 175,000 tons. This can be considered as fairly representative average tonnage for a furnace lining, although there is a decided trend toward increased life of linings and higher tonnages per lining.

The failure of a furnace to attain an average tonnage on a lining is more often due to improper construction or to adverse and uncontrollable operating conditions than to poor brick, stated Mr. Berg. This does not mean, however, that refractory materials today are perfect, but it has been amply demonstrated that when proper care, skill and attention have been

given to the manufacture of brick and to the construction and operation of a furnace, a very long life has been obtained.

Relining in Six to Eight Weeks

Mr. Berg estimated the average time necessary for a complete relining to be six to eight weeks. In this time the furnace would have to be cleaned out, the stock left in the furnace from the blowing out operation would have to be removed, the brick lining and the salamander would have to be taken out, the new brick lining installed, cooling devices re-erected and all machinery and equipment reinstalled. The new lining would then have to be dried out before the furnace would be ready to operate.

The equipment or parts of a furnace which cannot be replaced without stopping the furnace are more and more, wherever permissible, designed and constructed so as to last the life of a lining, stated Mr. Berg. The larger size modern furnace has resulted in more regular and uniform operation, leaving the furnace less affected by unexpected and uncontrollable changes in raw materials and weather conditions. All matters having a beneficial influence toward more regular operation will prolong the life of a brick lining.

An important factor in preserving the lining of a furnace, according to Mr. Berg, is the adoption of the proper lines. A departure from the flat and high boshes of old, and the development of the steeper and lower bosh of today have had a tremendous influence on the smoothness and more regular operation of the furnaces. Proper charging, distribution of materials and distribution of outgoing gases also are material aids in preserving the lining.

Consulting Economist Needed

Every blast furnace should have a consulting economist to advise the management, stated E. F. DuBrul, general manager National Machine Tool Builders Association, Cincinnati, in an address at the afternoon session. Mr. DuBrul predicted that the merchant furnace which will be successful in the future will have several plants, so that it can regulate its production to conform to market conditions. The company operating only one stack is either producing iron at capacity or is completely shut down, a course necessitated by the inflexibility of a blast furnace.

Sellers of pig iron, according to Mr. DuBrul, have been poor merchants and have only once, in recent years, in 1923, benefited by a rising market. He pointed out that a temporary low price of iron does not stimulate demand in general. The only firms or individuals that profit by a low price are those in a position to speculate. Mr. DuBrul exhibited charts based on his own formula for forecasting the trend of pig iron prices, and also indicated by a chart that the trend of machine tool shipments is generally followed by a similar trend in pig iron production and shipments.

H. Foster Bain, New York, secretary of the American Institute of Mining and Metallurgical Engineers, was the chief speaker at the evening meeting. He discussed industrial conditions in England. Short talks were made by a number of visitors and members. E. F. DuBrul and Edwin Jones, Globe Iron Co., Jackson, Ohio, were elected members. Ralph H. Sweetser, president of the association, presided at both the afternoon and evening sessions.

The total apparent consumption of Babbitt metal in the United States, as reported to the Department of Commerce from 27 firms, was 4,954,683 lb. in November as compared with 5,550,247 lb. in October. The total apparent consumption to Dec. 1, 1925, was 57,527,122 lb., of which 44,369,643 lb. was sold by manufacturers.

SEEK SAFER METHODS

Steel Companies in Pennsylvania Discuss Accident Prevention

HARRISBURG, PA., Jan. 23.—Operating heads of more than a score of steel companies met here on Monday, Jan. 18, at the suggestion of R. H. Lansburgh, Secretary of Labor and Industry, for an interchange of information on ways and means of reducing accidents. Use of goggles, care in the use of cranes and education of new men were among the chief topics discussed. The principal speakers, aside from Secretary Lansburgh, were J. M. Larkin, Bethlehem Steel Co.; L. A. Burnett, Carnegie Steel Co.; Stephen W. Tener, American Steel & Wire Co., and Carroll Burton and D. C. Thomas, Lorain Steel Co.

Secretary Lansburgh, in his opening remarks, asserted that the safety record of steel companies of the State was good, that each of the companies represented had been able to reduce the number of accidents in 1925 in face of material increase in employment, but that safety men throughout the State say that they are finding it increasingly difficult to implant the safety idea in new employees and particularly in new employees of the younger generation.

Each executive was urged to analyze thoroughly the make-up of the "safety organization of his plant, to see that it is, in fact, as strongly developed as it would be in case it was charged with production duties, to see that it is alive and reaches into all parts of the plant, and to see that it reaches every man. Finally, to see that it is adequately provided for financially, in relation to both the human and financial savings which it can make by reducing the accident toll."

Compensation Law Loses Force

This recommendation was made by Secretary Lansburgh after he declared that the State compensation law, enacted in 1916, does not now have the force to reduce accidents that it did immediately after enactment, because its costs have come to be accepted in the cost of production; that safety slogans are now "old stuff"

without the power of attracting attention that they once had; that accidents are largely from handling objects, and from slipping and falling, and not from the operation of machines and furnaces; that one of the real factors in reducing accidents in the iron and steel plants of Pennsylvania would be to charge the cost of each accident into the cost of production of the shop where it occurred.

Secretary Lansburgh paid tribute to the safety record of the Lorain Steel Co., Johnstown. This plant, he said, established a remarkable record during the last several years. "It is a large plant and has not killed a man, and has only 30 reportable accidents in two years," he said. "It recently went 115 days without a lost time accident. It has done this through a very remarkable safety organization and through the interest in safety of all of the operating executives, including the president of the company." Mr. Burton later explained the plant's safety organization.

Firms Represented, with Their Delegates

American Bridge Co., Marshall Williams, assistant to the president, and W. W. Merrill, casualty manager; National Tube Co., Thomas Ewing, assistant to the president; Carnegie Steel Co., L. A. Burnett, assistant to the president; American Sheet & Tin Plate Co., A. E. Logan, manager of safety and welfare; Union Steel Casting Co., D. J. Evans, superintendent; Reading Iron Co., J. R. Roe and G. W. Delany; Babcock & Wilcox Co., H. H. Murray; Midvale Steel Co., J. P. Mudd, safety director; Lukens Steel Co., D. L. Wolcott, assistant to the president, and George Irwin, manager of the welfare department; Pittsburgh Crucible Steel Co., R. B. Wisner; Jones & Laughlin Steel Corporation, E. F. Blank, safety director; Allegheny Steel Co., F. W. Walker, head of the safety department; Colonial Steel Co., H. C. Poole; Carpenter Steel Co., E. J. Poole, general superintendent, and C. T. Miley, safety engineer; Firth-Sterling Steel Co., H. C. Fishley, superintendent of employment and safety, and C. E. Stevenson; Standard Steel Works, F. J. Graham, safety director, and W. L. Thomas; Bethlehem Steel Co., J. M. Larkin, assistant to the president, and J. E. Culliney, safety engineer; Lorain Steel Co., Carroll Burton, president, and D. C. Thomas, manager of safety and employment; American Steel & Wire Co., S. W. Tener.

Output, Wages, Prices Well Balanced

Employment Gains in 18 of 25 Industries—Real Earnings Decline Slightly

Industrial activity, which on the whole has been increasing ever since last July, when the period of spring and summer let-up came to an end, has regained its former momentum. Not only has employment steadily increased since July, but the average weekly earnings of those now employed have regained the same high level that prevailed early in 1925 and just before the slump in 1924, according to monthly studies of wages, hours and employment by the National Industrial Conference Board, 247 Park Avenue, New York. The return to this comparatively high level of earnings of the workers, together with steadily increasing employment, the conference board's wage study declares, indicates that at this level the elements of production, wages and other costs and prices are well balanced.

Employment in November showed an increase of 1.8 per cent over October, and a total increase of nearly 6 per cent since July, 1925, according to the last monthly study of the board, covering 25 different industries employing a total of about 700,000 wage earners. With the November gain, employment now for the first time is practically the same as it was before the 1924 depression set in.

Average weekly earnings in all industries increased slightly during the month, making the fourth consecutive increase since last July, and representing an average weekly gain of 82c. per worker over the July earnings.

Most notable during the month of November was

the increased activity of the agricultural implement industry, showing a gain in employment of 8 per cent, the employment index for this industry rising from 71.3 to 77.0 in November, while the average working week in this industry increased from 49.6 to 50.5 hr. In all, 18 of the 25 industries covered by the study showed gains in employment. Average work hours per week in all industries showed a slight gain, from 48.3 to 48.5 hr.

Average weekly earnings of all wage earners included in the study in November were 116 per cent greater than in July, 1914. "Real" weekly earnings, indicating the amount of goods the worker can buy with his wages in supplying the ordinary needs of his family, in November were 26 per cent higher than in July, 1914. Owing to slight increases in the cost of living in October and November, real hourly and real weekly earnings showed a slight decline for November.

May Extend Barge Service to Minneapolis

Gen. Thomas Q. Ashburn, who operates the Mississippi-Warrior barge line, recently met committees representing Minneapolis and St. Paul to consider the establishment of a barge line between the twin cities and St. Louis. If the final decision on this project is favorable, service will start about April 15.

The N. & G. Taylor Co., Inc., Philadelphia, will close one of the departments at its Cumberland, Md., works about March 1 so that certain improvements may be made. The company expects to have sufficient advance stock made up to carry it through the period of inactivity.

SAFETY TROPHY AWARDED

Carnegie Plants in Youngstown District Reduce Lost Time Accidents 76 Per Cent

FOR the fifth consecutive year the Carnegie Steel Co., Pittsburgh, has offered for competition a beautiful bronze safety trophy which will become the permanent possession of one of its plants excelling in safety work. Safety on a competitive basis met with such enthusiasm among the employees that it has been continued from year to year, and as a climax to the allegorical themes of the various trophies, this year's prize is larger and carries the suggestion of reaching a goal.



The trophies are competed for from month to month during the year. A plant making the best record for one month holds the trophy for the succeeding month, and at the end of the year it is awarded permanently on the year's record. It was a problem to work out a basis of competition that would put large and small plants on even terms. After much study, it was decided that each plant or unit should compete with its own previous record, and now the prize is awarded to the plant making the greatest percentage of reduction in lost time accidents from its own previous

average for the same month during the previous five years. Likewise, the yearly record is compared with the average for the plant for the preceding five years.

The 1925 trophy has just been awarded to the Youngstown district of the Carnegie Steel Co., which includes the Upper and Lower Union works and the Ohio works at Youngstown and the McDonald works at McDonald, Ohio. The Youngstown district scored a reduction of lost time accidents during the year of 75.74 per cent from its average of the preceding five years. The next best showing was by the Farrell, Pa., works with a reduction of 63.03 per cent, while Clairton works stood third with a reduction of 54.51 per cent. The 1925 trophy is to be presented to the men of the Youngstown district at a large mass meeting, at which officials of the company are to be present.

American Holzwarth Gas Turbine Co. Formed

The Holzwarth Gas Turbine Co. of America, recently incorporated in Delaware, has acquired the patents and rights to manufacture and sell in the United States and Canada the Holzwarth gas and oil turbines which have been developed and built by Thyssen & Co., Mulheim-Ruhr, Germany, according to a statement issued by *Marine Engineering and Shipping Age*. This turbine possesses thermal efficiencies comparable with those of existing prime movers.

Hans Holzwarth, inventor of the turbine and former chief engineer of the Thyssen Works, is vice-president and engineering director of the American company. The offices are at 504 Standard Oil Building, San Francisco, and its European address is care of Thyssen & Co., Mulheim-Ruhr, Germany. The American company has negotiated certain contracts with the Thyssen firm in Germany and prolonged tests under commercial conditions are to be run on a 5000-kw. gas turbine and

a small oil turbine at the Thyssen Works in the near future. Invitations to witness these tests have been extended to a number of engineers, manufacturers and power producers in the United States and in other countries.

Description of the Holzwarth gas turbine was given, in some detail, in *THE IRON AGE*, Nov. 20 and Nov. 27, 1924, pages 1329 and 1407.

Pacific Coast Steel Conference

Discusses European Competition and Organizes Reinforcing Steel Institute of California

DEL MONTE, CAL., Jan. 23.—Outstanding developments at the second annual conference of the iron, steel and allied industries of California, held here Jan. 21, 22 and 23, were as follows:

1. The declaration by Wiggenton E. Creed, president Pacific Gas & Electric Co. and Columbia Steel Corporation, San Francisco, that today the American steel industry faces a serious situation in respect to world competition because of cheap labor costs in Europe, low foreign exchange, and the use of American capital by European steel and power industries for technical developments and sales expansion programs.

2. An address by Chester H. Rowell, newspaper writer and former publisher of the *Fresno Republican*, in which he stated that one of the reasons European iron and steel can be sold in the United States below domestic quotations is because in Europe the technical expert enjoys responsibilities and authority equal to that now held by the financier in America.

3. Organization of the Reinforcing Steel Institute of California, and the filing of applications for membership in the National Concrete Reinforcing Steel Institute by ten California firms, following an address by C. Louis Meyer, treasurer of the national institute.

4. A petition sent by the Structural Steel Fabricators of California to the American Institute of Steel Construction requesting that the institute open a district office on the Pacific Coast as soon as possible.

5. The reelection of Maynard McFie, Los Angeles, as chairman of the executive committee, the election of John D. Fenstermacher, San Francisco, as vice-chairman, and the re-election of Charles S. Knight, San Francisco, as secretary.

Bookings of Commercial Steel Castings Less in 1925

December sales of steel castings, as reported by the Department of Commerce, amounted to 85,397 net tons, or 85.1 per cent of works capacity. This is the highest figure since the preceding December, which showed 96,164 tons or 95.8 per cent of capacity. Total bookings for the year amounted to 731,743 tons, compared with 772,840 tons in 1924, the decrease having been about 5½ per cent.

Railroad specialties booked in December aggregated 43,215 tons or 100.5 per cent of capacity. This again was the largest total since the preceding December, when the amount was 53,332 tons or 124 per cent of capacity. Miscellaneous castings in December aggregated 42,182 tons or 73.5 per cent of capacity, again being the largest since the preceding December, which showed 42,832 tons and 74.6 per cent of capacity. Except for the preceding December, the current figures for miscellaneous castings are the largest for more than two years. With railroad specialties and with the total, the figures for March, 1924, were larger than the current figures.

The year's sales of miscellaneous castings at 436,218 tons showed a gain of 13.4 per cent over the 384,483 tons of 1924. All of the loss in total tonnage came in railroad specialties, which dropped from 388,357 tons in 1924 to 295,525 in 1925. This decrease amounted to 24 per cent.

INTEREST IN WELDING

Revision of Unfired Pressure Vessel Code Suggested, and Applications of Welding Discussed

The applications and methods of fusion welding were interestingly dealt with at a joint meeting of the Metropolitan section of the American Society of Mechanical Engineers and the New York section of the American Welding Society, held Jan. 14, at the Engineering Societies Building, New York. The meeting, held in the auditorium, was well attended. A. G. Oehler, associate editor of *Railway Age*, and president of the welding society, presided.

An outstanding paper was on "Welded Pressure Vessels," by S. W. Miller, consulting engineer, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y., who held that the limitations placed on welding in the unfired pressure vessel code of the A. S. M. E. Boiler Code Committee were unduly severe. He advocated revision of the code and outlined a code which he thought suitable, although not perhaps the last word, and also gave specifications for materials, etc., which he thought might be followed in designing and welding unfired pressure vessels. It is planned to abstract Mr. Miller's paper in a forthcoming issue of *THE IRON AGE*.

In discussing materials, Mr. Miller said that steel plate containing 0.15 per cent carbon and under will give the best welding job. The present A. S. M. E. code specifies 0.15 per cent to 0.25 per cent carbon. He said that the lower carbon material is less affected by the heat of welding and that the lower the carbon the better the distribution of welding stresses, the lower the carbon the higher the relative strength of the weld so that the plate would break rather than the weld. The fiber stress allowed for butt double-vee longitudinal welds should be, he said, 8000 lb. per sq. in. and for butt single-vee girth or head welds, 6500 lb. Mr. Miller requested no limitation as to the size and contents of pressure vessels, indicating that it is a matter of design and proper operation in service. He said that the limiting pressure should not be 100 lb. per sq. in. and cited examples of pressure vessels designed for 250 lb. working pressure that stood more than five times that pressure before bursting. The advantages of welding process were outlined and it was said that at the present time it is no more difficult to train men to make good welds than it is to train them to make a good product of any kind. Welding when properly controlled will be the same as any other process when properly controlled, he said.

Following Mr. Miller, C. W. Obert and V. M. Frost, secretary and member, respectively, of the A. S. M. E. Boiler Code Committee, spoke unofficially, saying that the code could grow as needed and that suggestions for changes would be welcomed from any source. In the general discussion W. Spraragen, secretary of the American Bureau of Welding, stated that the American Welding Society has asked the Bureau, through the National Research Council, to sponsor an investigation to supply the A. S. M. E. Boiler Code Committee with information and data needed to modify the present code. A \$100,000 investigational program has been proposed.

Engineers Should Study Welding Process

Recent applications of electric arc, resistance, gas and thermit welding were reviewed and shown by slides by E. H. Ewertz, general manager, Moore plant, Bethlehem Shipbuilding Corporation. Obstacles to the more rapid extension of welding were said to be the tendency to cling to tradition and the lack of knowledge of the welding process on the part of engineers. The title of Mr. Ewertz's paper was "A Partial Review of Outstanding Applications of Welding."

"Welding as a Means of Fabricating Tanks, Vessels and Pipes" was a paper by W. Schenstrom, welding engineer, Electric Welding Co. of America, 744 Court Street, Brooklyn, N. Y. This paper, also illustrated by numerous lantern slides, dealt with a variety of unusual applications. Welding, said Mr. Schenstrom, is treated

in many ways as a stepchild by engineers, and in many plants welding is in charge of the boiler making or the machine shop foreman. Welded acid tanks, agitators, pipe lines, and gasoline tanks were pictured and discussed. An interesting example of precision welding was a mixer for a chemical plant, the mixer being 6½ ft. in diameter and arranged to rotate on shafts which are required to be within 0.001 in. in alignment. Another example of precision work was the welding of a 6 x 24 x 26-ft. tank for use in developing moving picture films. The alignment in this case had to be within 1/32 in. The welding of a large vacuum bottle for use by an asphalt company was an unusual application shown. The bottle has an inner and outer shell and it is said that a 29-in. vacuum can be obtained by regular production methods.

Interest was shown in the application of electric welding in the construction of oil tanks, and it was brought out that an outstanding advantage of the welded tank was the reduction in the loss of oil by evaporation, a case being cited where this loss was reduced more than 60 per cent. In response to a question as to the maximum thickness of metal that can be spot welded, W. Spraragen, secretary of the American Bureau of Welding, said that spot welding had not been developed for heavy sections, although an experimental machine was built during the war for spot welding ½-in. material. There are electrical difficulties, etc., but it was said that undoubtedly equipment would be placed on the market if the demand warranted.

Blast Furnace and Coke Oven Association to Meet in Pittsburgh

The next meeting of the Eastern States Blast Furnace and Coke Oven Association to be held at the William Penn hotel, Pittsburgh, Feb. 12, will be an all-day session with three papers to be read, one in the morning and two in the afternoon. "Effect of the Physical Properties of Ore and Coke on the Capacity of the Blast Furnace" is the subject of a paper by T. L. Joseph, P. H. Royster and S. P. Kinney, Pittsburgh Station, United States Bureau of Mines. "An Experience in Serving Two Groups of Blast Furnaces with a Single Coke Plant" is the subject of Dan M. Rugg, Koppers Co., Pittsburgh, and "Selective Segregation of Coking Coal at the Mine and Its Preparation at the Ovens" will be covered by B. W. Winship, superintendent Steelton coke plant, Bethlehem Steel Co.

John Fritz Medal Awarded to Edward Dean Adams

Award of the John Fritz Gold Medal, the highest honor bestowed by the engineering profession in this country, to Edward Dean Adams of New York, has been announced by the Engineering Foundation. The award is for achievement as "an engineer, financier, scientist, whose vision, courage and industry made possible the birth at Niagara Falls of hydro-electric power."

Mr. Adams was graduated as a bachelor of science from Norwich University in 1864, and afterward pursued engineering studies at Massachusetts Institute of Technology. He has been a fellow of American Society of Civil Engineers since 1891, an associate of American Institute of Electrical Engineers since 1910, vice-chairman of the Engineering Foundation from its beginning, and for years an active member and officer of the Engineering Societies Library.

He is a member of the National Research Council. It was on his decision that alternating current was chosen for the epoch-making plant of the Niagara Falls Power Co. in 1891 and for the transmission of the power by wire to Buffalo.

Mr. Adams has been a patron of several scientific investigations and has personally participated in some of them. Most of his long business life has been devoted to large enterprises combining engineering and finance. He had a leading part in the organization and reorganization of numerous railroads, including the

West Shore, the Central of New Jersey, the Western Maryland and the Northern Pacific. For 15 years he was a member of the banking firm of Winslow, Lanier & Co., New York, and for 21 years American representative of the Deutsche Bank of Berlin.

Program for Spring Meeting of Institute of Metals

The program of papers to be read at the spring meeting of the Institute of Metals in London, March 10 and 11, is as follows:

"Note on the Softening of Strain-Hardened Metals and Its Relation to Creep," by R. W. Bailey.

"Note on the Corrosion of an Ancient Tin Specimen," by Prof. C. O. Bannister.

"Some Experiments on the Soft-Soldering of Copper," by T. B. Crow.

"Determination of Zinc Oxide in Brass," by B. S. Evans and H. F. Richards.

"Crystal Growth in Recrystallized Cold-Worked Metals," by Dr. W. Feitknecht of Berne, Switzerland.

"The Interpretation of the Macrostructure of Cast Metals," by R. Genders.

"The Hardness of Cold-Rolled Copper," by Samuel L. Hoyt and T. R. Schermerhorn (Schenectady, N. Y.).

"Researches on the Nature, Properties and Conditions of Formation of Intermetallic Compounds. I-V. I.—The application of the phase rule to systems containing intermetallic or other compounds, and the interpretation of certain points in connection with equilibrium diagrams; II.—The nature of intermetallic compounds; III.—The nature of metallic phases of variable composition; IV.—The system calcium-tin; V.—The system magnesium-tin," by W. Hume-Rothery.

"The Brittle Ranges of Bronze," by W. L. Kent.

"The Influence of Gases on Copper at High Temperatures. Part I," by A. Glynne Lobley and Douglas Jepson.

"The Die-Casting of Aluminum Alloys—A Review of Current Methods," by George Mortimer.

"The Constitution of the Alloys of Copper and Tin," by A. J. Murphy.

"Striation Due to Working or to Corrosion in Microscopical Metallography. A Contribution to the Study of the Mode of Action of Etching Agents," by A. M. Portevin (Paris, France).

"The Copper-Rich Aluminum-Copper Alloy," by D. Stockdale.

"The Mechanical Properties at High Temperatures of an Alloy of Nickel and Copper, with Special Reference to Creep," by H. J. Tapsell.

To Hold Technical Sessions at Time of Chemical Exposition

A special committee, consisting of C. B. Murray, secretary of the Ohio section of the American Institute of Mining and Metallurgical Engineers; J. Rowland Brown, American Society of Mechanical Engineers; James H. Herron, American Society of Mechanical Engineers, and W. H. Eisenman, secretary of the American Society for Steel Treating, has been appointed, representing engineering and chemistry, to cooperate in preparing an unusual technical program for the week of May 10 to 15, in conjunction with the Second Chemical Equipment, Machinery and Process Engineering Exposition of the Association of Chemical Equipment Manufacturers in Cleveland.

In addition to these three societies, which, through Messrs. Murray, Brown, Herron and Eisenman, are assuming responsibility for the program, local sections, chapters or membership groups of the American Association of Engineers, the Society of Industrial Engineers, the American Society of Heating and Ventilating Engineers, the American Institute of Electrical Engineers, the American Society of Civil Engineers, the American Chemical Society and the American Electrochemical Society, are also involved.

The occasion of this inter-related and comprehensive technical program, the Association of Chemical Equipment Manufacturers' Second National Exposition, is a showing of equipment, materials, machinery and accessories, basic to the application of all the

chemical processes to industrial production. It will be held in the Public Hall in Cleveland and will include the latest devices, methods, operating equipment and machinery.

The technical program will embrace the practical consideration of chemical and electrochemical processes, materials of construction with particular reference to ferrous and non-ferrous alloys and rubber, ceramics, mechanical design in relation to crushing and grinding, mixing, precipitation, etc. It will reflect the inter-relation of the chemical, civil, electrical, metallurgical, heating and ventilating, welding testing materials, mechanical and industrial engineers and of the chemist, in the application of the "processing idea" in productive industry, with the exposition as an illustrative and connecting background.

Technical sessions will begin on May 10, in the Hotel Hollenden, and continue throughout the week.

Germany Loses Advantages in Export Machinery Trade

The National Machine Tool Builders Association, in a report to its members, calls attention to changes which have taken place in the German machinery trade, particularly as they affect export selling. "Before the war," the report says, "German industry was supported in its export efforts by special government cooperation, such as special freight rates on government railroads, special banking facilities, etc. At the end of the war all these special advantages were wiped out. Now that they have to go on a really competitive basis, German manufacturers are having great difficulty in maintaining their export business." The report continues:

"There are many evidences of the over-capacity of German industry, which was commented on at a recent meeting of the German Machinery Builders' Association. The manager of that association stated that there are 100 German lathe factories, which is possibly three or four times as many as are in the United States. Before the war Germany had 40 railroad car plants, and now has 60. He recommended a continuance of the present movement for mergers, which has already resulted in forming 150 merged companies out of 600 plants. Mergers in paper making have shown 23 per cent saving in wages, by specializing the types produced. One printing machinery plant replaced 26 types of machines in 119 different sizes, by one single kind in four sizes, thus greatly reducing production cost.

"The Germans are no longer anxious to offer special equipment, recognizing the waste produced by excess variety, special designs, and small scale production. Hereafter they are seemingly going to try to beat us at our own game, but it will take them some time to reorganize their industry.

"Our American manufacturers are today in an exceptionally favorable position, while British and German competitors are seriously handicapped. So the present is a favorable time for Americans to go after export business, and do the missionary work that would be required to entrench themselves in various markets at the present favorable opportunity, before the Germans and British get to the stage of manufacturing efficiency in which Americans now are."

The Spanish-English text of the American Society for Testing Materials standard specifications for open-hearth steel girder rails of plain, grooved, and guard types, A. S. T. M., special designation A 2-24, has just been released as industrial standard No. 3 of Spanish-English edition of industrial standards being revised by the Bureau of Foreign and Domestic Commerce. Copies may be procured from the Superintendent of Documents, Government Printing Office, at 5c. each.

An engineering conference of broad scope will be held at Detroit, Feb. 4 and 5, at the Hotel Tuller. It is sponsored by over 20 local sections of technical and engineering societies. The general topics include the regulation of the Great Lakes, commercial air transportation, stream pollution and building codes.

BOOK REVIEWS

Wire Drawing and the Cold Working of Steel. By Alastair T. Adam. Pages 212, 7½ x 10 in., illustrated. Published by H. F. & G. Witherby, 326 High Holborn, London, W. C. 1. Price, \$16; obtainable from D. Van Nostrand, 8 Warren Street, New York.

This book is hard to classify. As it is the first treatise on the subject since 1891 and purports to cover a tremendous amount of ground, it is perhaps inevitable that it should be of the "shot-gun" variety, scoring heavily on some portions of the target, and scarcely touching others. It might better be entitled "Combined Effect of Cold Drawing and Heat Treatment on High-Carbon Steel Wires." Here is where the author's interest lies and he touches on other aspects of cold working rather lightly and by way of preparation or contrast. Other subjects discussed rank about as follows:

- Low-Carbon Steel Wire
- Cold Rolling of Steel
- Non-Ferrous Metals
- Other Forms of Cold Work.

The book will make its strongest appeal to those interested in rope, spring, music and similar grades of wire. Even here, however, in spite of its many tables it cannot be regarded as a practical working tool. Mr. Adam evidently believes that in working out drawing practice every man should "hoe his own potatoes," and he goes no further than to help him sharpen his hoe.

The book as a whole is clearly written, logically arranged, (a matter of delicacy with so complex a subject) and distinctly readable. It brings out admirably the truly marvelous nature of the wire drawing process through which, with associated heat treatments, that alloy which we call steel can be endowed with extraordinary combinations of desirable properties. In this respect wire drawing stands alone and so far in front that there is no second. One hesitates to find fault with so readable a book, but if Mr. Adam has a weakness it is a passion for leaving no little point unexplained, and in the exercise of this laudable ambition he has screwed down the coffin lid on what seem to the writer some decidedly live issues. The writer does not feel competent to challenge him, but feels that if Mr. Adam could be brought before a jury of experts some bonny arguments would ensue.

Chapter I is introductory in character. Chapter II, on preliminary operations, is clearly regarded by the author as introductory to the main theme, but will none the less interest many readers beyond the layman class. It deals with the raw material, the influence on steel of the common metals and metalloids, pickling, coating and baking. It will surprise many to find oxygen named as one of the greatest enemies of the wire drawer, and the chief cause of cut-out dies; not scale, as the word is commonly understood, but minute specks of iron oxide embedded in the steel (presumably the result of oxygen taken into solution in the molten steel).

In discussing "inhibitors" the author attributes their effectiveness to colloidal action. He does not mention the fact that the value of an inhibitor varies directly with its nitrogen content rather than its colloidal nature, nor does he speculate as to the possibility that the iron is rendered passive, and that what actually dissolves is a layer of oxide rich in iron. Some of these complex oxides will dissolve readily without evolution of hydrogen. The passivity theory is supported by the known fact that steel pickled in the presence of a nitrogenous inhibitor is decidedly reluctant to take on a hydrated oxide coating.

Chapter III discusses the actual drawing of wire through the die, under various sub-headings relating to die shapes, amount of draft, lubrication, speed, nature of flow, and relative advantages of wet and dry drawing. The treatment of these matters is largely elementary, to serve as a foundation for the real discussions to follow. The section relating to wet and dry drawing is not convincing. In the section headed "Wire Gages

and Reduction per Pass" the reader will be surprised to find Mr. Adam attempting a defense of the "gage number" system.

Chapter IV deals in a rather perfunctory way with cold working processes other than wire drawing.

In Chapter V, heat treatment, the author settles down to solid work. Heat treatment in general and the annealing of low carbon wire are adequately treated, in a way that will interest both layman and expert, and patenting is lucidly discussed. The summary at the end of this chapter is particularly meaty.

Chapter VI deals with effects of cold work on the physical properties of metals. The effect of cold work is shown to be profound, not merely in practical ways but in ways as yet of academic interest alone. For instance, cold work affects not only the solubility of wire in acid, but also the gaseous products of that reaction. Hardness resulting from cold work is seen to be a quality scarcely deserving the name, none of the crystalline constituents being actually hardened, though the stiffness of the whole mass is increased.

Mr. Adam says: "Roughly speaking, the tenacity of a hard drawn wire of any metal is proportional to the original strength of the metal and to the amount of reduction it has received." This is true enough, and perhaps as far as a scientist would care to commit himself, but as a practical man Mr. Adam might well go further and enlarge on the interesting relation between increase in tenacity and percentage of reduction of area by cold work. In the American system of measuring tenacity in pounds rather than gross tons per square inch, the relation is beautifully simple, each per cent of reduction raising the tenacity by 1000 lb. per sq. in. This relation holds only for the homogeneous structures, ferrite and sorbite, and within certain limits of drafting, but most commercial work lies in this same range, and the relation is of immense practical value in calculating power requirements.

The author discusses the effect of cold drawing on each of the physical properties of steel including, in addition to those noted above, ductility and flexibility, elongation, reduction in area, torsion, etc., but is somewhat embarrassed by the vagueness of certain of these terms.

In Chapter VII, a continuation of Chapter VI, the properties discussed are elastic limit, resistance to fatigue, density, electrical and magnetic properties and resistance to corrosion. It will surprise many to read that the density of a metal is decreased by cold drawing. This is of course apart from "accidental" increase in density due to the closing up of cavities. The author finds that density increases again upon annealing drawn wire. As he does not definitely state that the annealing was in vacuo we are left in doubt as to whether the increase shown in his tables is attributable to adsorption of gases. We are not at all ready to accept this particular thesis as established.

Chapter VIII, the effect of heat treatment after cold work. Many of the effects of cold work, some of them beneficial, can never be removed by subsequent heat treatment. Some effects, however, are either removed or profoundly modified not merely by heating to varying temperatures, some surprisingly low, but even by aging. Cold drawn steel is shown to be an unstable material, some of whose properties can be readily enhanced, generally at the expense of others. Tinning and galvanizing are discussed as unavoidable heat treatments.

Chapter IX, theories of plastic flow, must be chiefly over the head of the reviewer, for after several readings he is still lacking a clear picture of the internal mechanics of wire drawing. If curves are plotted showing the relation between reduction of area in drawing and increase in tenacity, they are straight lines up to a point which varies roughly from 70 to 90 per cent reduction, depending on amount of carbon. Beyond this point there are several breaks in the curves, low-carbon breaking in one direction, high-carbon in the other. The present writer has a feeling that when a clear picture of the nature of flow in wire drawing is finally gained it will come through a study of these breaks.

Chapter X, on the pathological aspect of cold work-

ing operations, deals with defects of all kinds. The author is in error in stating that the phenomenon of grain growth in lightly drafted and annealed ferrite is of little practical importance. The instances he cites are unusual but in bolt and rivet manufacture grain growth is a frequent and puzzling problem. "Cuppy" wire he attributes chiefly to casting and rolling defects. If British mills made more use of cast iron dies, the part played by the faulty die hole would be clearer.

The concluding Chapter XI deals briefly with non-ferrous metals under cold work.

The appendix consists of a table of four of the more common gage systems of the English speaking countries. It is, of itself, sufficient answer to the author's defence of the "gage number" system of wire measurement.

K. B. L.

Harvard Business Reports. Compiled by Graduate School of Business Administration, Harvard University. Pages 561 + xxix, 6 x 9 in. Published by A. W. Shaw Co., Chicago. Price, \$7.50 net.

Business instruction on the system of cases, such as has long been employed in teaching law, has been made possible by the collection of 149 business cases into this volume. In most instances a fictitious company name is given, but the cases themselves are authentic representations of what was found upon analysis. It is the aim of these reports to build up, eventually, a volume of recorded business precedents readily accessible for business executives. These are to be provided with careful cross-indexes—with which the present volume is provided—to facilitate use for reference purposes. The cases here reported were culled from over 3500 cases collected through the Bureau of Business Research.

Each case reported has particular importance as an example of current business practice, or as a guide to sound business management. The decision stated in each case is that of the business firm—not the editorial opinion of the Harvard Business School. Each case presents an actual situation which arose in the conduct of business, tells the method by which the existing situation was met and the real reasons which inspired the selection of that method. The facts are first made plain, then the issues for decision are described and the company's decision with influencing factors, definitely explained. Concise headnotes at the beginning of each case briefly summarize the facts and indicate the definite decision.

As a pioneer in a field too little explored, the series of which this volume is the initial one should do much to provide a broader background for the business executive than is possible through his own practice. The characteristics of questions coming up among the 149 cases in this work are so varied that one could be selected to fit, with certain modifications perhaps, almost any conceivable business problem. The project which is under way is undoubtedly ambitious, but it should have the support which its inherent importance demands.

Ocean Shipping. By Robert Edwards Annin. Pages 427, 5 x 8 in.; illustrations 6. Published by the Century Co., New York. Price, \$3.

This book, which is one of the Century Co.'s Foreign Trade Series, considers fundamentally the practical elements of steamship management and operation; takes up freight rates, labor problems, the officering and manning of ships, selection of the ship, fueling, handling of cargo on the dock and its stowing in the ship, foreign exchange, marine insurance, etc.; and in the appendix there are copies of important documents which should be of constant use to the exporter.

The importance of the merchant marine is shown with regard to Great Britain and Germany, with the harm done to Austria and Switzerland when these shipless countries were cut off from the ocean by the Great War; while the fact that the existence of our own country was only secured by the sudden creation of a merchant marine at all costs is pointed out. The author is emphatic in his statement that whether our Government

retains its fleet under political control or sells it, the continuance of the American flag on the high seas will depend upon successful competition with the merchant fleets of other nations. The problem of disposing of the misfits of the marine fleet is taken up and handled without gloves; as is also that of discarding misfit managers. The author very aptly says that "A collection of ready made ships bears the same relation to a merchant marine as 12 violins and a bassoon bear to a symphony orchestra. The question of operation is quite as vital as the instruments."

The range of the shipping business is taken up in Chapter II, the British and the American requirements of officers and crew in Chapter V. The "Black Horse Cavalry"—meaning the profiteers in shipping rates—receive a scoring in Chapter VI. Commencing with Chapter XV we have the machinery of foreign trade; telling the routine followed by the shipper in procuring orders, the risks he must incur, and his limitations as to freighting the goods he has sold.

It should be valuable to any one who has goods to export, as well as to those already engaged in or just embarking in the shipping business.

Gr.

The Coal Industry. By A. T. Shurick. Published by Little, Brown & Co., Boston, 1924. Pages 383, 5½ x 8½ in.; illustrations, 57. Price, \$3.50.

This excellent and well printed work is intended to give the public a proper understanding of the coal industry, literally "from the ground up"—from mine to consumer's bin. Part I covers the coal fields; Part II, mining methods; Part III, the distribution of the coal; Part IV, economic and sociological conditions.

The first chapter would go into the discovery of coal if we knew anything about it; all the author can say in this connection being that it was mentioned by Theophrastus about 2200, and in England about 1100, years ago; while our first knowledge thereof in America seems to be a report in 1679, after which 100 years elapsed before anything more was said about it. The difficulty with anthracite was burning it with natural draft.

The seven American coal fields are taken up in approximately the order of their commercial value, from the anthracite to the Pacific Coast region. The fact is regretted that we can make no reliable figures about coal reserves, although our Geological Survey stated in 1914 that we had about 3539 billion tons available at depths under 3000 feet, and another 666 billion under 6000. Our maximum annual output will probably be in 2035 about 20½ billion tons.

Mining methods are handled in considerable detail, from the earliest and most primitive to the latest methods of opening a mine. Ventilation, lighting and timbering are taken up duly.

That there are over 3,000,000 hp. used in and around our coal mines will be a surprise to most. The author does not neglect the important item of the preparation of the coal for the market.

As to treat of all the varieties and values of coal would take many large volumes, the author has not attempted to give more than a general outline, in which he is very successful. The subject of coal markets is rather a difficult one, but is treated quite fairly. Of the cost to the consumer, it is shown that about 45 to 61 per cent goes to the producers; transportation gets 16 to 21; the dealer 20 to 32; the entire profits being 11 per cent, of which the producers and wholesalers get 7 per cent, the retailer 4.

Chapter V of Book IV considers the various complexes of the miner, of whom in the anthracite region nearly 53 per cent are foreign born, one of the principal difficulties in this connection being his inability to understand instructions. That the average earnings of the anthracite miner in 1921 (an off year in the bituminous district) were \$1,922, for 250 days' work, has no bearing on the question of real wages. The bituminous miner in 1920 received over \$2,000.

A very thorough appendix of statistical tables concludes this valuable book of reference which makes also interesting reading.

ROBERT GRIMSHAW.

Demand for Iron and Steel Products Will Continue Large

Possible Declines in Building and Automotive Industries Likely to
Be Offset by Increases in Other Lines

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

JUST at present much uncertainty exists in the business world and this is no doubt increased by the recent weakness in the stock market. Such uncertainty is not uncommon in January, which lies between the usual seasons of maximum activity, and the present irregular and uncertain trend of commodity prices has added to the seasonal factor.

More important, however, is the current doubt concerning the trend of two of our basic industries—building and automobile production. Together, these two industries ordinarily consume between 25 and 30 per cent of the steel output of the country and their trend is thus of especial significance to the iron and steel industry. It is rather generally conceded that in both cases it is improbable that the large expansion of recent years will be continued in 1926 and some observers look for a decided decline. In either event, it is certain that the rate of gain in steel production would be affected unless other steel consuming industries should expand sufficiently to make up the loss.

But while the current uncertainty and hesitation (which, by the way, had been forecast by our P-V Line) are thus easily understood, careful analysis shows that there is no fundamental reason to doubt that industry will continue at a high rate for a good many months and that the demand for iron and steel will be large. None of the critical maladjustments which usually precede an industrial decline exist today. Manufacturing production and retail distribution are well balanced. Labor is well employed, but not scarce. Money is fairly easy and ample credit exists. Even in the doubtful cases of building activity and automobile production, there is no reason to anticipate any serious condition. Probably there is yet no general over-building, and, although it is likely that building activity will not continue to expand as in the past, there is every probability that it will remain large throughout most of 1926. A check upon the rate of building expansion would require merely a less rapid gain in the production of structural steel plates, sheets, and other steel products largely dependent upon building—not an actual decline.

Much the same may be said of the automobile situation. The prospect is for a very large production of motor cars in the first part of 1926. Indeed, production

of trucks and buses will probably expand throughout the year, as no one would maintain that the saturation point for these vehicles is near.

Profit Margin Smaller

IT is true, however, that the margin of profits both in building and in automobile sales will undoubtedly be narrower in 1926 and greater pressure for price concessions on raw materials will be the tendency.

It is perhaps fair to say that some uncertainty exists concerning the railroad market for steel, but it is hard to see how the demand can fail to be large. Equipment buying last year was disappointing to steel producers but large traffic and earnings are bound to result in large material purchases, and the budgets announced by the various carriers for the coming year are certainly encouraging.

The oil industry is in a similar position. Declining crude production will mean less new storage, but more drilling, pipe line construction, etc. The prospect for earnings in the petroleum industry is good.

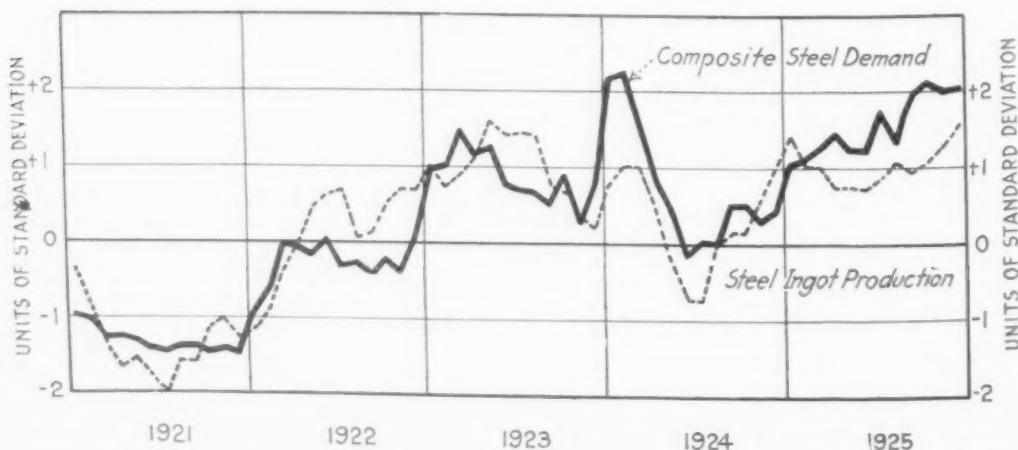
Two branches of the steel industry have a decidedly good outlook; the demand for tin plate is growing and, with higher standards of living becoming effective, the use of tin containers for foods and other products promises to expand. A very favorable outlook also obtains with regard to farm machinery and implements. The last report of the Illinois Department of Labor states that in the agricultural implement industry employment rose 4 per cent to the highest point since the employment statistics were started in Illinois (1921). In his field, too, the export outlook is bright.

In this issue there is presented for the first time a new department of THE IRON AGE Business Analyst and Forecast Section. The new department will deal with the demand for iron and steel and will present each month various statistical charts worked out at the New York University Bureau of Business Research.

Composite Steel Demand

IN this issue the first chart shows the estimated trend of the composite demand for steel. The demand curve represents a weighted average of the activities of

Fig. 1—Steel Ingot Production Has Not Kept Up to the Estimated Demand for Steel, as Indicated by the Fact That the Demand Curve Has Been Above the Production Curve for Nearly a Year



In This Issue

Likely to be increased demand for steel from railroads, farm implement makers, tin can producers, etc.—Should offset any possible declines in the automotive and building industries.—Page 290.

Average pig iron tonnage made on one lining is 707,000 tons.—Average time for relining estimated at six to eight weeks: association agrees on 350 operating days a year as basis for rating capacity.—Page 283.

Suggests forecasting orders by means of quotations.—Increase or decrease in ratio between quotations made and business secured indicates upward or downward trend in demand for machine tools: applicable to other businesses.—Page 278.

Average net earnings of various industrial companies for 1921-24 inclusive said to be \$6 per \$100 invested capital.—During same period average of 46 steel companies was \$4.25 per \$100 of capital invested.—Pages 271, 297.

Light stocks carried by consuming industries mean absence of cancellation evil, no great inventory losses and healthier business conditions.—Seller is in a more secure position under system of frequent reorders than under period of long contracts.—Page 296.

Few manufacturers know how to make prices that will result in fair profits.—Figuring prices on a basis of capacity higher than actual operations or above that capacity at which the whole industry can operate, is business suicide.—Page 261.

Much new construction planned among Pittsburgh mills.—Weirton Steel Co. has \$15,000,000 program; Pittsburgh Crucible Steel Co. will install 12 and 14-in. merchant mills, Columbia Steel Co. will order two 30-in. mills and Carnegie Steel Co. plans many improvements.

Bookings of steel castings for 1925 dropped 5.5 per cent from previous year.—December showed considerable decline from November: Practically all the annual loss came in railroad specialties.—Page 285.

What is an "open price" association?—Federal Trade Commission again tilts against the trade association windmill, unable to decide what constitutes illegal activity.—Page 263.

Claims A.S.M.E. Boiler Code places unfair restrictions on welding.—Says limiting pressure on welded pressure vessels should not be 100 lb. per sq. in., and that fiber stress for the weld should be 8000 instead of 5600 lb. per sq. in.—Page 286.

Blast furnace heat exchanger dries gas with heat from hot blast.—Removes moisture from washed gas used in blast furnace stoves.—Page 269.

Quality of steel often controlled by some factor not measured in metallurgist's laboratory.—Is oxygen, in form of dissolved gas, or dissolved or precipitated oxides responsible for most of defects which cannot be explained by metallurgist?—Page 264.

New development in steel treating credited to W. P. Sykes.—Embraces retention of so-called delta iron solid solutions at low temperatures and heat treatment of these solid solutions.—Pages 266, 267.

Tools made by forge hardening possess no advantage over those hardened by means of gas, oil-fired or electric furnaces.—Bureau of Standards finds no appreciable difference in quality of treated tool.—Page 282.

More electric furnaces installed in 1925 than for any year since war.—Forty-three new furnaces put into operation: 83 in last two years.—Page 298.

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Price Charts and Steel Distribution

ONCE a year THE IRON AGE publishes diagrams showing price changes over a long period of years in a variety of metal products. Once a year it shows graphically where went the steel produced during the preceding twelve-month and of what varieties the output consisted. Both sets of data appear in the first issue of January.

In conformity with our regular custom, these charts have been reprinted and are now available for distribution. It is our wish that their message may be as widely disseminated as possible. Anyone requiring the information they give is heartily welcome to a copy, upon request.

For News Summary See Reverse Side

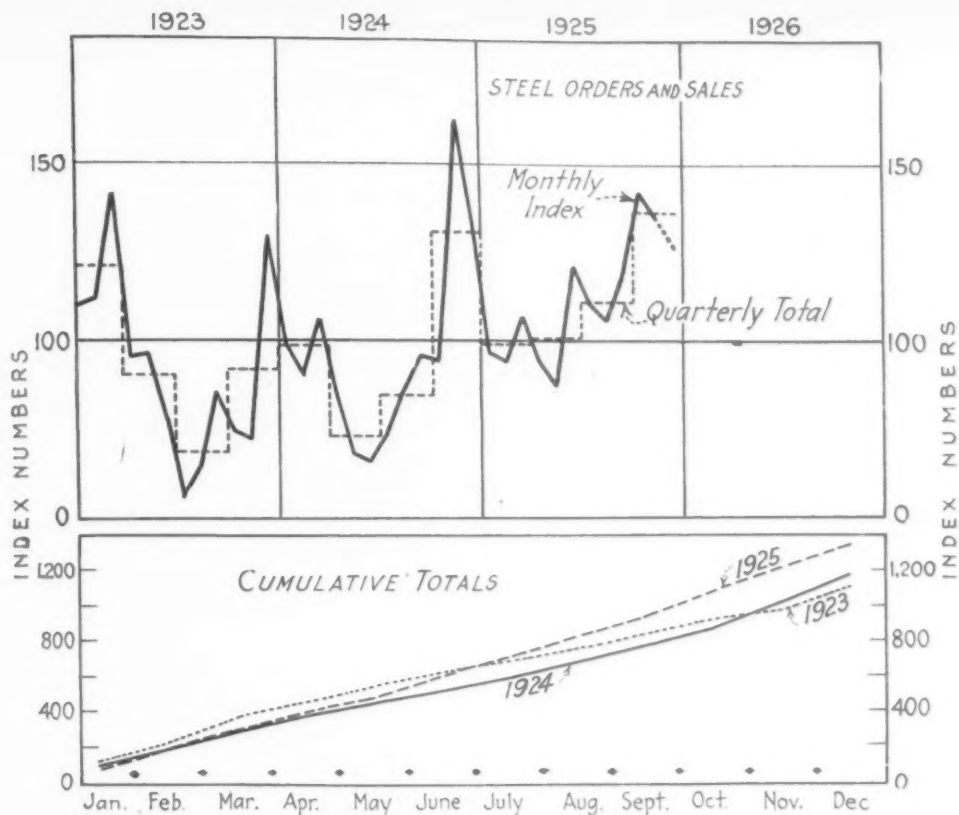


Fig. 2—The Monthly Index of Steel Products Sales Shows the Usual Seasonal Decline, but Is Well Above the Level Reached at This Time a Year Ago

leading steel using industries. Such an average is not necessarily reflected immediately in orders. At the present time, for example, the railroads are well supplied with cars and locomotives and, in spite of large traffic, orders for equipment may therefore, be considerably delayed. The building data used represent contracts awarded and are naturally not reflected at once in actual construction. But sooner or later the activities reflected in the demand curve must mean purchases of steel.

Above all, there is good reason to believe that as long as steel production continues in proportion to the composite demand line, it is not excessive, and danger of overproduction exists only when steel production for several months runs above the indicated trend of composite demand.

Fig. 1 shows that the demand trend was steadily upward during 1925 and that it rose at a more rapid rate than on the average during the last five years. Between the end of 1924 and the end of 1925 railroad

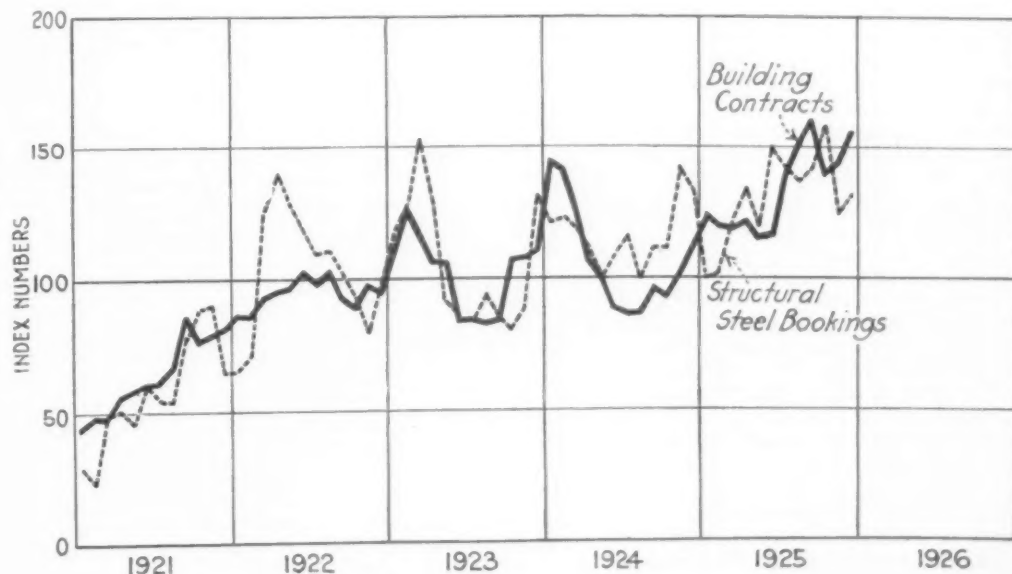
activity increased about 7 per cent, building activity 14 per cent, automobile production 16½ per cent, and the composite demand line shows a gain during the year of 12½ per cent.

Steel production, however, did not increase so rapidly. As is shown in Fig. 1, the trend of the output of steel ingots has hardly kept pace with the activity of the steel-using industries and the ingot curve is, if anything, a little under what the demand curve would justify. It, therefore, seems reasonable to say that the present output may be maintained over a period of several months without resulting in overproduction. However, if profits narrow in the steel using industries, pressure may be brought to bear on steel prices.

Sales of Steel Products

THE second graph shows the trend of finished steel orders and sales. Being a composite picture of orders, bookings and sales of some of the chief finished steel products, it is one of the most interesting and bar-

Fig. 3—Building Contracts Awarded May Decline During 1926 but There Are No Indications That This Will Be a Poor Year for Structural Steel Interests



ometric of our statistical compilations. The solid line shows the monthly sum of the orders, etc., and its movement represents the trend of new business in finished steel. The dashed line shows the total booked or sold during the quarter. The cumulative totals in the lower half of the graph enable a comparison of the business in one year with preceding years for a period down to the latest available month of the current year.

The data show that the general trend of steel product sales was upward throughout 1925, thus confirming the composite demand line described above. The monthly index shows an irregular rising trend and each quarterly total was higher than the preceding. The absence of the severe summer declines which occurred in 1923 and in 1924 makes the total new business for 1925 considerably greater than that of 1923 or 1924.

The cumulative curves show that, while the year began at a lower point as to new business in steel products than either of the preceding ones, there was a steady gain and the twelve months total was considerably the greatest of the three—and a record for the industry.

While November new business was much smaller than in 1924, it was far above 1923 and the total for

tively small in comparison with the trend of building contracts awarded, the steel curve being further below the building curve than in any November-December period covered in the graph. It follows that *structural steel bookings should be well maintained in the near future and that some gain is probable.*

Structural steel bookings in the second half of 1925 were the largest of any like period. As between 15 and 18 per cent of the total steel production of the country is consumed in building and construction, this fact has had much to do with the recent activity of the industry and the probable continuation of activity in building in the first half of 1926 promises continued large demand for steel.

Need for Railroad Equipment

IT is common knowledge that railroad equipment orders were relatively small in 1925, but it is not so generally recognized that such orders gained rapidly in the second half of the year. Probably the outstanding fact shown by Fig. 4 is the large gain in orders for cars and locomotives in the latter half of last year. The trend was upward at the end of the year, as in 1923; while at the end of 1924 there was a downward movement.

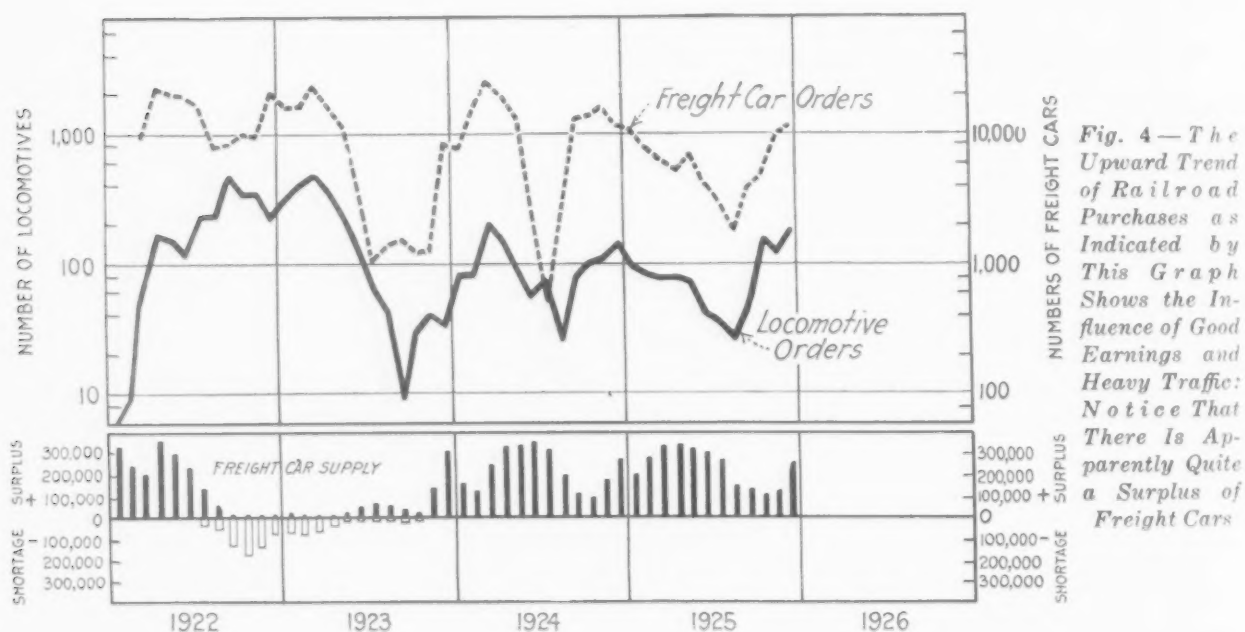


Fig. 4—The Upward Trend of Railroad Purchases as Indicated by This Graph Shows the Influence of Good Earnings and Heavy Traffic: Notice That There Is Apparently Quite a Surplus of Freight Cars

the last quarter of 1925 was a little better than in 1924.

The statistician will be interested in noting that our curve of steel sales resembles rather closely the curve of changes in unfilled steel orders which is presented each month in this department, and that to some extent it is similar to the general trend of the P-V line. While the downward trend in November and December may be interpreted as seasonal, the fact that the downturn came earlier this year than in 1923 or 1924 confirms the other two barometers in their forecasts of a temporary lull in new business.

Building Trades Demand

FIG. 3 shows the remarkably close relation between the general trend of structural steel bookings and building contracts awarded. Both have had a steady growth since early 1921 with an especially sharp upward trend in 1925. The bookings of structural steel do not fall far below the curve of building activity nor stay below it long. Nearly always an upturn in building contracts is followed by a gain in structural steel bookings, although downturns in the bookings (which are partly seasonal) often occur while the adjusted curve of building activity is still moving upward.

At present, bookings of structural steel are rela-

It may also be noted that locomotive orders in December were greater than in the same month of either preceding year and that even freight car orders were larger than in December, 1924.

With the traffic of the railroads, as measured in ton-miles, as large as it is, equipment orders are bound to make a better showing in the first half of 1926. The only drawback lies in the existence of a large quantity of surplus equipment. The railroads have had a surplus of freight cars in good order during every month of the last two years (see Fig. 4) and under such circumstances they do not need to buy except for ordinary replacement purposes. The surplus at the end of December, 1925, however, was smaller than in any recent year and it may be noted that the even larger surplus of freight cars in December, 1923, did not prevent very large car orders from developing in the spring of the following year. As to locomotives, the most recent data show that not only have orders gained, but that in spite of increased shipments the unfilled orders are the largest in over two years.

The development of the oil-electric type of locomotive will undoubtedly cause uncertainty for some time, but the probable development in the use of the new type will ultimately mean an increase in the business of the locomotive companies.

STEEL IMPORTERS ACTIVE

Foreign Prices Taken on Rails, Billets, Bars and Pipe—Japan Inquires for Tubes and Tin Plate

NEW YORK, Jan. 26.—Decision is expected soon on several of the inquiries for various steel products on which importers have been submitting quotations. Among various tonnages is the 5000 tons of high-carbon, open-hearth rails for which the Interborough Rapid Transit Co., New York, made inquiry about one year ago. At the time the specifications were issued it was stated by the railroad that these were future requirements and would not be purchased for some time. The 15,000 tons of rails for the Boston & Maine Railroad is also expected to be settled in a week or two and it is reported that part of the tonnage of forging billets asked for by the Ford Motor Co. has been placed with an importer. A rail purchase of about 4000 tons of 60 to 80-lb. sections is reported to have been made in the Chicago district from a Belgian mill at about \$25.40 per ton, f.o.b. Antwerp.

The San Joaquin Valley project in California involving close to 5000 ft. of pipe was finally awarded to a Czechoslovakian interest, "Ferrum," which will furnish and install banded pipe. Other California projects on which foreign bids are being received are those of the Southern California Edison Co. and the Feather River Light & Power Co. Another pipe purchase recently reported to have been made in Europe is a total of about 2200 tons of the lap welded steel pipe placed with a German mill by a contractor executing work for the Department of Water Supply, Gas and Electricity, New York.

Foreign Steel Wanted for Re-Export

There is apparently a rapidly developing interest in foreign steel among manufacturers of products for export, because of the drawback on the duty when the imported material is exported as a manufactured prod-

uct. It is evidently with this purpose in mind that the Ford interests are negotiating for forging billets. At the same time there is a large volume of steel undoubtedly being bought for use in concrete and structural steel work. In this connection it is noteworthy that the P. J. Carlin Co., New York, which has a sewer contract in Brooklyn, N. Y., has closed with an importer for 500 tons of open-hearth reinforcing bars. A lot of about 150 tons is understood to have gone to domestic mills for prompt shipment. About a year ago a total of 5500 tons of open-hearth bars were purchased for this contract through William H. Muller & Co., New York.

Japan Inquires for Pipe and Tin Plate

In export, an outstanding inquiry is from the Tokio Gas Co., for 1,000,000 ft. of $\frac{3}{4}$ -in. and 60,000 ft. of $\frac{1}{2}$ -in. black gas pipe. The Nippon Oil Co. is inquiring for 22,350 base boxes of oil can tin plate. Since the withdrawal of a large mill which had been quoting \$84 per ton, c.i.f. Japan on light gage black sheets, the sheet market is apparently quotable at about \$85 per ton, c.i.f. Japan. Meanwhile, British sellers are reported making quotations of close to \$80 per ton, c.i.f. Japan. Judged by reports from Japan, an increase in the tariff is practically assured, the amount of the increase being the principal subject under discussion. Exporters in close touch with Japan are inclined to place the increase on sheets at about 20 per cent based on the present market price, the new duty being on a specific basis rather than, as at present, ad valorem. Blast furnace interests in Japan have recently been urging a higher duty on pig iron, the present tariff calling for only about 95c. per ton, but as India is a large supplier of pig iron to Japanese consumers and at the same time a heavy purchaser of cotton goods, tinware and other commodities, no change in the tariff is expected.

No award has been made as yet on the pending rail business from Japan, which includes 35 miles of 80-lb. rails and 250 tons of tie-plates for the South Manchuria Railway Co. and a smaller tonnage of 60-lb. rails for a privately owned railroad.

New Cement Company to Use Blast Furnace Slag

L. A. Beeghley, president of the Standard Slag Co., Youngstown, and of the Buffalo Slag Co., Buffalo, with associates, has organized the Federal Portland Cement Co. to produce cement, using blast furnace slag and limestone. Two plants are to be built, one at Buffalo and the other at Cleveland, in connection with slag reducing properties operated by the slag companies. The Buffalo plant, states Mr. Beeghley, will require an investment of \$2,000,000, and will have an initial capacity of 3000 bbl. of cement per day. It will be erected first and the plant at Cleveland later. The Bethlehem Steel Corporation is financially interested in the undertaking, as mentioned on page 241, issue of Jan. 21.

Steel Plant Construction Is Active at Pittsburgh

PITTSBURGH, Jan. 25.—It is some time since there was as much steel plant extension and betterment work in progress and in sight as is true at present. Besides the \$15,000,000 program of the Weirton Steel Co., Weirton, W. Va., which has been started by the placing of contracts for an addition to the by-product coke plant and for an 800-ton blast furnace, as well as the steel for housing of the extension to the open hearth department, the Pittsburgh Crucible Steel Co., the Carnegie Steel Co. and the Columbia Steel Co., are among those with new construction mapped out for early execution.

The Pittsburgh Crucible Steel Co., will install a 12- and 14-in. merchant mill for rolling alloy steel bars. The Columbia Steel Co., which was recently merged with the Forged Steel Wheel Co., Butler, Pa., under the name of the former will soon place orders for two 30-

in. mills, one for hot rolling and the other for cold rolling a new product to be known as sheet-strip.

Besides continuing the betterments at its Homestead works, Carnegie Steel Co. again is asking bids on much equipment for its Mingo, Ohio, works. It will be recalled that about a year ago, the company authorized the building of an open hearth furnace department at that works, but no actual work was started. It now looks as though this construction would soon get under way and in connection with this is a report that the company will concentrate at that point and abandon its Bellaire, Ohio, plant, further south along the Ohio River. An addition of 300 coke ovens at Clairton, Pa., is scheduled and it is apparently the intention of the company to make that plant capable of serving more blast furnaces than does the present installation.

The Carnegie company has also decided to build a fleet of 70 river barges and 3 river steamers.

Investigates Bundling of Concrete Bars

The standard practice committee of the Concrete Reinforcing Steel Institute, 160 North LaSalle Street, Chicago, is mailing out a questionnaire to gain information with regard to the practice of member companies in bundling and tagging both straight and bent bars. The following questions are being asked: 1. What is the average weight of bundles? 2. What is the gage of wrapping wire? 3. How many wrapping wires are used per bundle? 4. What material is your tag made of? 5. How many tags do you put on each bundle? 6. What information do you put on each tag? 7. How is this information affixed to the tag? 8. How are tags attached to bundles?

A ninth question on bent bars relates to the system of marking, as to size, type and location, put on the tag. The questionnaires cover both carload lots and less than carload lots.

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Lighter Stocks Needed

THERE has been much comment on the fact that with the excellent railroad service lately furnished it is unnecessary for large stocks to be carried. The comment may be extended to cover a great deal more ground, for railroad service is not the only factor, and the change in the circumstances in business is not confined to the matter of stocks. It extends to the commitments that are made, in contracts or purchases for extended delivery. That sort of business has been greatly reduced.

There are three important factors: capacity, transportation and service. In many manufacturing industries the capacity relative to average demand has been higher since the war than formerly, though the excess is not infrequently overestimated. There is, for one thing, more flexibility. The war showed that many things previously thought impossible could be done, and the typical manufacturing industry is better able to run at above normal capacity, perhaps at extra expense, than formerly.

The second factor, greatly improved transportation, is well understood. The third factor, service, has an important influence. The producer recognizes a greater responsibility, to serve customers with deliveries as desired, than was formerly the case. The idea of service has grown remarkably in the past few years. Thus far the conception of service is chiefly of the vendor to the vendee. Business relations will be improved further when there is more mutuality, when the vendee recognizes a duty to the vendor.

The greatly reduced stocks now needed for safety and smooth conduct of business involve a great saving, really the elimination of an economic loss. Less capital is needed, also less warehouse space, and there is saving in the cost of handling. All this tends to increase the physical volume of business, for the cost to the ultimate consumer is reduced.

Entirely separate from the reduction of stocks is the reduction in forward commitments. The change in the steel trade is very notable. A three-month period is usually the limit, and a great deal of business is done even without quarterly con-

tracts. Before the war contracts used to extend to six months or even a year. Those contracts were made because both parties considered them necessary. The seller feared that otherwise he would not have employment, the buyer that otherwise he would not receive supplies. Yet the contracts often proved a delusion to one party or the other, according to how things went.

With light stocks and little contracting, trade stands on a real foundation. Consuming demand is the controlling factor in the long run, and consumption does not vary so much from month to month or quarter to quarter as did the buying and the shipments in the old days. The buying fell in relatively short periods, there being intermediate periods of a dull market, when correspondingly little evidence was furnished by the market as to where trade really stood. As to stocks, a very little cloud on the business horizon caused a great desire to liquidate stocks, and the liquidation greatly accentuated the adverse trend.

Business is today in a much sounder and more stable condition than it would be were it operating according to the old practices. Liquidation of stocks and cancellation or suspension of contracts can have little influence, for there is little that can be done in that way. Instead of the seller being in less protected position, through not having an apparently well-filled order book for months to come, he is in more secure position, for he knows that when demand falls off it must reappear all the sooner.

THE Bureau of the Census is now engaged in collecting the data for the biennial census of manufactures, which will cover industrial operations during the calendar year of 1925. The director of the census has agreed to make a tabulation for each city within a few weeks after the receipt of the last schedule, properly and accurately filled out, and to publish the results of this tabulation in the form of a preliminary report. At the census of 1923 it was necessary to send more than 100,000 letters to manufacturers requesting additional information or verification or correction of their reports. Careful estimates will be accepted in lieu of exact figures. The

value of production, not sales, is specially desired. Where no exact records of production are kept, the value of the production for the year may be ascertained by adding to the value of goods sold, the increase in the stocks of finished goods (or stocks in the process of manufacture) on hand at the end of the year as compared with the beginning of the year, or by deducting the decrease in such stocks from the value of goods sold. The figures are published for the benefit of the manufacturing industry and the usefulness of census statistics is increased, of course, by making them available at an early date.

Profits and Manufacturing Hazards

FAIR profits are necessary to the perpetuation of industry. What should be considered fair, however, has always been an open question. Unquestionably the risk involved in a given investment is an important measure of the fairness of returns. The hazards of manufacturing are great. In a statement before the Interstate Commerce Commission in its rate structure investigation Charles Piez, president Illinois Manufacturers' Association, quotes statistics of the United States Treasury Department which show that in the years 1920 to 1923, inclusive, 35 to 40 per cent of the manufacturing corporations of the country reported deficits. In the words of Mr. Piez, only the fact that adversity rarely hits the same classes of manufacturers for any long extended period saves them from being wiped out.

Sharp alternations from profits to deficits make it necessary for industries to show large returns in some years to balance losses in others. Greater stability in business would permit a revision of views on what constitutes fair profits, and it would appear that some progress has been made in that direction. The lessons of 1920 and 1921 have not been forgotten. Pyramiding of prices to unnatural levels is no longer desired by manufacturers, who suffered keenly from the inevitable reaction which followed the 1920 boom. In the steel industry caution in advancing prices has become almost as marked as resistance to declines. At the same time efforts have been concentrated on the reduction of costs.

Nevertheless the steel trade has not yet reached an economical basis of operations and at the moment is subject to concerted pressure for new concessions by one of its largest customers, the automobile industry. The sale of motor cars has been expanded by the consistent lowering of prices, and at present an effort is being made to pass part of the burden of fresh reductions to parts makers and steel mills.

The automobile industry is conspicuous for selling its products at less than pre-war prices. Notwithstanding the high state of efficiency attained in motor car manufacture, it would be unfair to state that the steel industry has not made commensurate progress in its field. The motor car industry before the war had not yet arrived. It is only in recent years that it has achieved the full benefits from mass production. A comparison of its present prices with those prevailing be-

fore the war, therefore, does not alone prove their fairness. According to an index of profits quoted by Mr. Piez in his testimony, the average profits of automobile makers in the four years, 1921 to 1924, were 8 per cent, as against only 4.25 per cent for the iron and steel industry. The figures suggest a disparity that is too great, considering relative risks, not to mention relative capital investment and capital turnover.

A Quarter Century

IN a manufacturing industry, as in the affairs of men, developments have no inherent disposition to class themselves according to the calendar of years, and reviewers and historians sometimes strain a point to make the years, the decades or the centuries stand out from one another.

While we cannot say that the quarter century just ended stands out in the development of the iron and steel trade entirely distinct from the preceding quarter century or the new quarter we are entering upon, it certainly has shown important characteristics, and when a certain amount of reviewing is necessary to give us poise and viewpoints, the present is a fitting time.

During the quarter century the production of pig iron in the United States practically tripled, while the production of steel ingots was multiplied by 4.4. That is, of course, vastly more progress in tonnage than was made in the preceding quarter century, while naturally enough it does not follow the geometrical ratio that pig iron had previously shown. A rate of doubling per decade would involve a multiplying by 5.66, a 466 per cent increase, in a quarter century. The iron industry had become too big for that.

For practical results, in benefit to mankind, our familiar tonnage measurement in steel is the worst, not the best. If words are intended to convey thought, the fewer words the better. Weight of steel is usually a detriment rather than an advantage, and measured by service steel has increased much more in the past quarter century than the number of tons indicates. In most connections carbon and alloy metals increase the service of steel, and if the quantity of carbon and alloy metals contained in steel in 1900 and 1925 respectively could be compared a vastly greater increase would be shown than is seen in the number of tons of steel.

From another viewpoint a conception can be obtained of the increased service per ton steel now renders. There has been great progress in the production of light forms. Sheets are rolled much thinner and wire is drawn much finer, while by comparison with the familiar strip of today, which involves in the neighborhood of a million net tons a year, the hoop of a quarter century ago is insignificant. That is, in length and area steel has greatly increased in the quarter century.

Steel, then, has increased greatly in mere tonnage, and has increased greatly also in quality and in form. A measure of its service to mankind is, in a sense, the continued product of these three factors. Yet in price per pound steel is only a few per cent higher than in the last two years of the nineteenth century. Measured by

service performed it is, on account of improvement in quality, much cheaper.

In one respect there is a clear line between the quarter century just ended and its predecessor. The earlier quarter was one of development of steel as the producer chose to make it or felt forced to make it. The buyer of steel had to take what was offered and use his own devices to employ it. It was practically altogether in this last quarter century that producers of steel got in touch with consuming problems and developed steel to solve those problems, and today the producers are very keen to go deeper and deeper into those problems.

Heavier Imports in 1925

IRON and steel imports in 1925, at 943,240 gross tons, show an increase of 69½ per cent over the 556,637 tons reported for 1924. While most of this increase appears in the less highly finished forms, it is, perhaps, significant that rolled iron and steel account for more than 100,000 tons of the gain, the total figures having been 318,746 tons in 1925 and 217,928 tons in 1924. Total imports in 1925 were the greatest for any calendar year since 1903, though less than the total for the fiscal year ended June 30, 1923.

Increases were recorded in structural shapes, with more than 77,000 tons against 43,000 tons, a gain of about 80 per cent. Tubular products, with nearly 83,000 tons against 54,500 tons, show a gain of 52 per cent. Much of this, of course, is cast iron pipe, which has not been segregated in the customs returns. Steel bars, which were lumped with the semi-finished products through 1924, are now reported separately. In 1925 the steel bars alone showed 58,800 tons while the group showed 85,900 tons, against a group total of only 39,000 tons in 1924. This gain is considerably more than 100 per cent, but it is impossible from data at hand to point to the specific items. Among the smaller items, bar iron has almost trebled, going from 4354 tons to 11,738 tons. The only considerable decrease in rolled material is in wire rope and insulated wire, which dropped from 13,654 tons to 2127 tons.

Pig iron imports more than doubled, jumping from 209,000 to 441,000 tons. At the same time the imports of ferromanganese, reported by manganese content only, increased 58 per cent from 48,000 to 76,000 tons. Manganese ore, however, gained only 4 per cent, reaching 265,688 tons. Scrap gained almost one-half, going from 66,800 to 99,800 tons. Ferrosilicon, on the other hand, dropped from 12,000 to 4555 tons.

While there are no decided tendency relations shown in a study of the month by month figures, it may be noted that the large influx began in December, 1924, both as regards the total imports and the imports of pig iron. Every month from that beginning has shown upward of 64,000 tons coming in, with the current December, at 98,400 tons, topping the list. Similarly, every month from the same beginning showed more than 21,000 tons of pig iron, with the current December again topping the list at 53,333 tons.

Another significant feature of the 1925 inward

movement lies in the fact that almost 20 per cent of the total came from British India, which sent us 185,349 tons. Belgium, Great Britain and Germany, in second, third and fourth positions, sent more than 100,000 tons each, with France and Canada at about 85,000 tons. While the bulk of the imports from India have been pig iron, it is generally believed that a large part went toward paying debts long owing on steel mill equipment made in this country for India.

Electric Furnace Expansion Last Year

UNFORTUNATELY adequate data are not available for measuring the increases each year in electric furnace melting capacity. The sizes of the new furnaces are not revealed. Judged by the number of sales for 1925, however, marked expansion in capacity was made. At 43 furnaces the year established a new record for sales in the United States since the war, as revealed by our analysis in the Annual Review Number, Jan. 7. The twelve-month record for the industry was 97 furnaces in the war year 1917. The 83 furnaces sold in the last two years were over 50 per cent of the total for the preceding five years, 1919 to 1923 inclusive. The electric furnace remains popular in the United States, though not so in several foreign countries.

Probably the feature of last year's progress was the widening application of electric melting to gray iron. The outstanding example last year was the decision of the Ford Motor Co. to duplex with the blast furnace. And on the Pacific Coast the same furnace was used for making both steel and gray iron castings. The electric furnace is clearly strengthening its position in the ferrous field more rapidly than generally supposed.

CORRESPONDENCE

Tantalum Versus Platinum-Iridium

To the Editor: In THE IRON AGE of Dec. 24, 1925, on page 1730, there is an article concerning the relative merits of tantalum, platinum and platinum-iridium as resistance metals. An article such as this, being in no wise complete and presenting only one phase, creates false impressions and it is sometimes quite difficult to restore a proper perspective of the subject.

In the first place, the statement accredited to Professor Withrow, that platinum has almost disappeared from manufacturing apparatus used in the chemical industry, is most thoroughly controverted by the amount of platinum that is employed therein. More of it is being used all the time as that industry increases.

While it is true that platinum entering into the manufacture of jewelry has increased its cost, and while its use for this purpose is to be deplored, nevertheless platinum as a catalyst is still in wide use and probably will remain so even though the cost has greatly increased in 12 years. But the closing of the Russian mines, greatly reducing the supply of platinum, was more responsible for the increased cost than its use in jewelry. Professor Withrow may not know that palladium and gold alloys are used very extensively in jewelry and contain only a relatively small amount of platinum, just enough to allow the term "platinum" to be given to the piece of jewelry.

Professor Withrow is quoted as comparing tan-

talum, platinum and platinum-iridium under conditions that are not clearly stated and are certainly far from being a complete comparison of the two metals and the one alloy. Commercial platinum practically always contains a small quantity of iridium. Pure platinum, such as used in a platinum-platinum-rhodium thermocouple, is seldom if ever encountered in industry except for this purpose. Consequently, where platinum is used in the industry, a small fraction of a per cent of iridium is present, and only a small fraction of a per cent of iridium is required to give platinum those physical characteristics that permit proper manipulation and enhance its practical usefulness. Pure platinum would be, in itself, entirely too soft for general use.

In addition to its stability, to its resistance to corrosion and its constancy of weight, platinum has great heat resistance properties. In this tantalum in no wise compares with platinum for, at temperatures that are relatively low, tantalum, if heated in air, is destroyed. Unquestionably tantalum in the chemical field has very definite applications and is an excellent metal for corrosion resistance under many conditions.

Tantalum cannot be worked mechanically as well as platinum, nor can it be made into the multiplicity of forms that is possible with platinum. The expense of even attempting to manufacture tantalum into some of the forms in which platinum is used would be very excessive and would result in the cost of tantalum, in those forms, being probably greater than platinum.

To make the unqualified and unlimited statement that tantalum lasts 1600 times longer than platinum and is one-twentieth cheaper is certainly an unusually broad one, based only on uncompleted experiments. Such announcements as these lead only to confused ideas and incorrect conclusions.

The relative cost of tantalum and platinum as given, platinum \$4,000 per kg. and tantalum \$250 per kg., is also misleading, for platinum, after its immediate usefulness in industry has passed, can be sold at a very high scrap value, so that the differential between the two brings the net cost of platinum quite low. This is not the case with tantalum.

As manufacturers of platinum for technical and industrial uses, we are writing this to emphasize the fallacies of the comparison which has been made and published.

Malvern, Pa., Dec. 30.

PAUL C. KERK,
J. Bishop & Co., Platinum Works.

German Steel Group Selling Bonds in United States

A flotation of \$25,000,000 in 7 per cent bonds, available at a price of 94, for the Rheinelbe Union, was announced by Dillon, Read & Co., New York, Jan. 26. About \$8,000,000 was withdrawn for sale in Europe, leaving about \$17,000,000 for distribution in the United States.

The Rheinelbe Union consists of three unified companies operating under intercompany agreements and constituting the largest coal-producing and iron-manufacturing group in the Ruhr district. These companies are Gelsenkirchener Bergwerks, A. G., Deutsche-Luxemburgische Bergwerks und Huetten A. G. and Bochumer Verein fuer Bergbau und Gussstahlfabrikation. They also form one of the largest steel manufacturers in Europe and produce a highly diversified line of highly finished steel products.

The Rheinelbe Union is the largest unit in the pending consolidation of important German steel and coal companies. Together with the Siemens companies, which are among the largest electrical companies in the world, the Union constitutes by agreement the Siemens-Rheinelbe-Schuckert Union, one of the strongest industrial combinations in Europe.

The fourth annual meeting of the sheet steel executives, like the previous ones, will be held at Greenbrier Hotel, White Sulphur Springs, W. Va., but will be held a little later this year than the former gatherings, coming the week of May 17, instead of in the first week of May.

Steel Corporation Earnings Drop

Last Year Below 1923 by 8 Per Cent—Betterment Appropriation \$25,000,000—Usual Dividend—Surplus \$4,632,000

Earnings of the United States Steel Corporation for the fourth quarter of 1925, according to the report made public Tuesday afternoon, were \$42,280,465, after the usual deductions, including interest on subsidiary company bonds. These compare with \$42,400,412 for the third quarter of last year.

Earnings for the year thus were shown to be \$165,188,090, comparing with \$153,114,812 in 1924 and \$179,646,674 in 1923. The volume of production in 1925 for the whole country was somewhat above that for 1923, so that, assuming the Steel Corporation obtained in 1925 a proportionate share of the total business of the country, the showing would seem to be a definite reflection of the effect of lower prices in the past year. In short, though the business volumes for the two years were substantially equal, the earnings this year were about 8 per cent off from those of 1923.

Appropriations for additions, improvements and betterments made or planned amounted to \$25,000,000. This left a surplus after the payment of preferred dividends and common dividend on an equivalent of a 7 per cent rate, of \$4,632,442. Last year the amount appropriated out of the surplus was \$20,000,000; in 1923 it was \$40,000,000; but in 1923 the common stock received only 5% per cent and the balance carried forward to undivided surplus was about \$14,260,000. The present extra dividend on the common stock is the tenth consecutive extra disbursement.

The following table gives the figures for the fourth quarter, and also the earnings for all four years:

Quarters	1925	1924	1923	1922
First	\$39,882,992	\$50,075,445	\$34,780,069	\$19,339,985
Second	40,624,221	41,381,039	47,858,181	27,286,945
Third	42,400,412	30,718,415	47,053,680	27,468,339
Fourth	42,280,465	30,762,231	49,958,980	27,552,392
	\$165,188,090	\$152,937,120	\$179,650,910	\$101,647,671

EARNINGS FOR FOURTH QUARTER

	Earnings Before Charging Interest on the Subsidiary Companies' Bonds Outstanding	Less: Interest on the Subsidiary Companies' Bonds Outstanding	Balance of Earnings
October, 1925....	\$15,295,256	\$703,281	\$14,591,975
November, 1925....	14,928,831	717,839	14,210,992
December, 1925....	14,200,935	723,437	13,477,498
	\$44,425,022	\$2,144,557	
Total earnings after deducting all expenses incident to operations.....			\$42,280,465
Less, charges and allowances for depreciation, applied as follows, viz.:			
To depreciation and extraordinary replacement funds and sinking funds on bonds of subsidiary companies		\$11,478,616	
To sinking funds on U. S. Steel Corporation bonds		2,704,227	
			14,182,843
Net income			\$28,097,622
Deduct: Interest for the quarter on U. S. Steel Corporation bonds outstanding		\$4,390,941	
Premium on bonds redeemed.....		294,548	
			4,685,489
Balance			\$23,412,133
Add: Net balance of sundry receipts and charges, including adjustments of various accounts..			122,041
Total			\$23,534,174
Dividends on stocks of the United States Steel Corporation, viz.:			
Preferred, 1% per cent.....		\$6,304,920	
Common, 1% per cent.....		6,353,782	
Extra common, 1/2 per cent.....		2,541,512	
			15,200,214
Surplus for quarter.....			\$8,333,960
Balance of surplus for nine months ended Sept. 30, 1925			21,298,482
			\$29,632,442
Sums appropriated and expended, or to be expended, for additions, improvements or betterments to plants and properties.....			25,000,000
Balance of surplus for year.....			\$4,632,442

Iron and Steel Markets

Uncertainty Follows Reduced Buying

Heavy Current Demands and High Operating Pace, but a Withholding of New Business, Partly to Depress Prices

DEMANDS against contracts and new orders have not expanded, as was widely expected at this time. Requirements continue to bulk large and operations are in unison with them and at the high rate of December, but more was looked for than has developed. The good promise of the year in point of steel demand remains unchanged and the signs are that the mills will gage production closely by definite needs.

Production of steel remains at last week's pace, being slightly higher with the United States Steel Corporation and slightly lower with the independents. In the finishing departments sheet mills alone will shortly need more specifications to avoid curtailment.

A drive against prices of automobile sheets, to secure a concession of \$2 to \$3 a ton below today's price, is holding up some buying. Also structural steel, railroad equipment and oil development projects, which supply tonnage business on top of going needs of regular manufacturing consumers, have been slow to materialize. It is the less spectacular buyer who is furnishing the backbone, taking steel at as fast a rate as mills will supply.

Higher prices, by the showing of January, appear not to be an early probability. In alloy steel concessions of \$2 a ton have been made by some producers on grades bought by the automobile trade. Plates are off \$1 in Pittsburgh. Railroad tie plates can be bought in Chicago at \$2 a ton below the first of the year level.

Judging from the pressure for deliveries, container manufacturers are evidently expecting another big year in fruit and vegetable packing. The leading tin plate maker is committed heavily for the next 90 days. There have been few periods when demand for stock items has been so great.

Fresh railroad inquiries include 2300 freight cars for the Illinois Central and two or three large lots of tie plates for Chicago mills. Some 1880 cars were ordered and several thousand are likely soon to be closed. The Minneapolis, St. Paul and Sault Ste. Marie is planning to buy 10,000 tons of rails.

Coated nails after Feb. 1 will be sold on a 100-lb. keg basis.

Upward of 20,000 tons of sheets have been bought by Japan. The Nippon Oil Co. is inquiring for 22,350 base boxes of oil size tin plate.

The earnings statement of the United States Steel Corporation for the fourth quarter, reported Tuesday afternoon, stands at once as an indication of the effect of low prices and operating efficiency. The total for the year, \$165,188,090, compares with \$179,646,674 in 1923, a year of substantially equal volume in tonnage. While there was thus a drop of 8 per cent in the earnings, steel prices for 1925 averaged 10 per cent below those of 1923, according to THE IRON AGE steel composites.

Among structural steel awards are 6650 tons for a City Hall in Los Angeles, 4000 tons for 25 barges for the Carnegie Steel Co. and 3500 tons for a New York loft building. A Camden shipyard has ordered 3000 tons of plates and 1150 tons of shapes for four New York Central car floats. The Lenoir Car Works is inquiring for 2000 tons of plates and 1800 tons of shapes for Southern Railway cars. The Pennsylvania has bought 1500 tons of plates for 100 locomotive tenders.

A Philadelphia importer has sold about 3000 tons of foreign bars and shapes for shipment to Florida at 1.90c. at dock, duty paid. The bars are to come from Germany and the shapes from Belgium.

Inquiry for pig iron for second quarter is making its appearance in several markets, and there have been sales totaling several thousand tons at prices approximating those for the first quarter. Some furnaces hesitate because of uncertainty of coke prices, and consumers are waiting for a similar reason, but with hopes of concessions. For early delivery 15,000 tons of basic iron was bought by the Inland Steel Co., Chicago, from the Iroquois furnace.

Further weakness in scrap prices has developed in nearly all markets. A surplus of scrap, together with a volume of buying below what had been expected this month, accounts largely for the decline.

Iron and steel imports in 1925 were the largest for any calendar year since 1903. At 943,240 tons, the increase over 556,637 tons in 1924 was 70 per cent. Rolled iron and steel, including semi-finished steel and a certain amount of cast-iron pipe, gained 100,000 tons, from 218,000 tons to 319,000 tons.

Finished steel has had another decline, THE IRON AGE composite price being 2.439c. per lb., compared with 2.446c. one week ago and 2.453c. two weeks ago. One year ago it stood at 2.560c.

Pittsburgh

Sheet Mills and Automobile Makers Deadlocked—Specifications Disappointing

PITTSBURGH, Jan. 26.—The first month of the new year has been somewhat disappointing to steel manufacturers, especially those who were expecting a considerable expansion in specifications and new business following the inventory lull. Consumers have been specifying with a fair degree of freedom in the past few weeks, but the general average is, if anything, a little less than in December and sentimentally, at least, the market reflects less cheerfulness than marked the closing months of last year.

Failure of business to increase has also had some effect upon prices. While there has not been much actual loss of ground in this direction, at least the mills have found it difficult to maintain the advances which came late last year, and in bars, shapes, plates

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous
For Early Delivery

Pig Iron, Per Gross Ton:	Jan. 26, 1926	Jan. 19, 1926	Dec. 28, 1925	Jan. 27, 1925
No. 2X, Philadelphia...	\$24.26	\$24.26	\$24.26	\$25.01
No. 2, Valley Furnace...	20.50	20.50	20.50	22.50
No. 2, Southern, Cin'ti...	25.69	25.69	25.69	24.05
No. 2, Birmingham, Ala...	22.00	22.00	22.00	20.00
No. 2 foundry, Ch'go furn...	23.00	23.00	23.00	24.00
Basic, del'd, eastern Pa...	23.00	23.00	23.00	24.25
Basic, Valley furnace...	20.00	20.00	20.00	22.00
Valley Bessemer del. P'gh	22.76	22.76	22.76	24.76
Malleable, Chicago furn...	23.00	23.00	23.00	24.00
Malleable, Valley...	20.50	20.50	20.50	22.50
Gray forge, Pittsburgh...	21.76	21.76	21.76	23.76
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.04
Ferromanganese, furnace...	115.00	115.00	115.00	115.00

Rails, Billets, etc., Per Gross Ton:

O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	35.00	35.00	35.00	37.00
O.-h. billets, Pittsburgh...	35.00	35.00	35.00	38.00
O.-h. sheet bars, P'gh...	36.00	36.00	36.00	39.00
Forging billets, base, P'gh...	40.00	40.00	40.00	42.50
O.-h. billets, Phila...	41.30	41.30	41.30	41.67
Wire rods, Pittsburgh...	45.00	45.00	45.00	48.00
Light rails at mill...	36.00	36.00	36.96	40.32
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb...	1.90	1.90	1.90	2.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.22	2.22	2.22	2.28
Iron bars, Chicago...	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh...	2.00	2.00	2.00	2.10
Steel bars, Chicago...	2.10	2.10	2.10	2.20
Steel bars, New York...	2.34	2.34	2.34	2.44
Tank plates, Pittsburgh...	1.80	1.85	1.90	2.00
Tank plates, Chicago...	2.10	2.10	2.10	2.30
Tank plates, New York...	2.09	2.09	2.09	2.34
Beams, Pittsburgh...	1.90	1.90	1.90	2.10
Beams, Chicago...	2.10	2.10	2.10	2.30
Beams, New York...	2.24	2.24	2.24	2.44
Steel hoops, Pittsburgh...	2.50	2.50	2.50	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Jan. 26, 1926	Jan. 19, 1926	Dec. 28, 1925	Jan. 27, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh...	3.35	3.35	3.35	3.60
Sheets, black, No. 28, Chi...	3.45	3.45	3.45	3.70
Sheets, galv., No. 28, P'gh...	4.60	4.60	4.60	4.75
Sheets, galv., No. 28, Chi...	4.70	4.70	4.70	4.85
Sheets, blue, 9 & 10, P'gh...	2.50	2.50	2.50	2.70
Sheets, blue, 9 & 10, Chi...	2.60	2.60	2.60	2.80
Wire nails, Pittsburgh...	2.65	2.65	2.65	2.85
Wire nails, Chicago dist...	2.70	2.70	2.70	2.95
Plain wire, Pittsburgh...	2.50	2.50	2.50	2.60
Plain wire, Chicago dist...	2.55	2.55	2.55	2.70
Barbed wire, galv., P'gh...	3.35	3.35	3.35	3.55
Barbed wire, galv., Chicago...	3.40	3.40	3.40	3.65
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:

Carwheels, Chicago...	\$18.00	\$18.00	\$18.00	\$20.00
Carwheels, Philadelphia...	17.50	18.00	18.50	19.50
Heavy steel scrap, P'gh...	18.00	18.50	19.00	20.50
Heavy steel scrap, Phila...	16.00	17.00	17.50	18.50
Heavy steel scrap, Ch'go...	14.75	15.25	15.25	18.00
No. 1 cast, Pittsburgh...	17.50	17.50	17.50	20.00
No. 1 cast, Philadelphia...	18.00	18.50	18.50	19.50
No. 1 cast, Ch'go (net ton)	17.00	17.00	17.00	19.00
No. 1 RR. wrst. Phila...	18.00	18.50	18.50	20.50
No. 1 RR. wrst. Ch'go (net)	13.50	13.50	13.50	16.00

Coke, Connellsville,

Per Net Ton at Oven:				
Furnace coke, prompt...	\$9.00	\$9.00	\$5.50	\$3.75
Foundry coke, prompt...	10.00	9.00	5.50	4.75

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.12½	14.12½	14.25	15.12½
Electrolytic copper, refinery	13.75	13.75	13.87½	14.62½
Zinc, St. Louis...	8.05	8.32½	8.62½	7.62½
Zinc, New York...	8.40	8.67½	8.97½	7.97½
Lead, St. Louis...	9.00	9.00	9.00	9.75
Lead, New York...	9.25	9.25	9.25	10.00
Tin (Strait), New York...	61.50	61.75	63.37½	57.25
Antimony (Asiatic), N. Y.	21.00	23.00	22.25	16.50

THE IRON AGE Composite Prices

Finished Steel

Jan. 26, 1926, 2.439c. Per Lb.

One week ago...	2.446c.
One month ago...	2.458c.
One year ago...	2.560c.
10-year pre-war average...	1.689c.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

High	Low
1925 2.560c., Jan. 6	2.396c., Aug. 18
1924 2.789c., Jan. 15	2.460c., Oct. 14
1923 2.824c., April 24	2.446c., Jan. 2

Pig Iron

Jan. 26, 1926, \$21.54 Per Gross Ton

One week ago...	\$21.54
One month ago...	21.54
One year ago...	22.50
10-year pre-war average...	15.72

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

High	Low
1925 \$22.50, Jan. 13	\$18.96, July 7
1924 22.88, Feb. 26	19.21, Nov. 3
1923 30.86, March 20	20.77, Nov. 20

and alloy steel bars there is no longer real insistence on the higher prices. Meanwhile the automobile builders continue their drive against the price of automobile body sheets, and the refusal of makers to entertain the bids which are \$2 to \$3 a ton below today's price, is holding up a large amount of business. There is not much reliance on the possibility of higher prices, and it begins to look as if the steel industry again this year would have to secure its profits in cost saving rather than in advancing prices.

It is interesting to observe that while there is no tendency on the part of steel manufacturers to relinquish the idea that this year will prove a good one in point of steel consumption, they are holding production more closely to actual business than was the case a year ago. Hence the relatively quiet condition of

the market has been quickly reflected in some letdown in plant activities. Ingot production in this and nearby districts now is running slightly under, rather than above, 85 per cent of capacity. This augurs well for price stability.

The steel industry does not take at face value the plans of the automobile industry for a 25 per cent increase in car, truck and tractor production this year, but after discounting that, the prospect of a good year remains, because it is figured that a good deal of railroad business will develop. In view of steel-making capacity and railroad efficiency, it is believed that short range buying will be even more the rule this year than last and that the curve of production will contain fewer hills and hummocks.

The scrap market has weakened further since a

week ago and the steel works grades are now \$1 a ton lower than earlier in the month. Extreme dullness still rules in the pig iron market and as might be expected after several weeks of limited demand, suggestions of weaker prices are beginning to be heard.

The third effort at a settlement of the hard coal strike has produced some hesitancy in the demand for anthracite substitutes, but as yet has brought no weakness in prices. The feeling is, however, that a settlement will be effected at this parley and that an easier coke situation is not far off.

Pig Iron.—A sale of 1000 tons of No. 3 foundry iron to a western Pennsylvania melter for delivery over the remainder of this quarter, was made at \$20, Valley furnace, and an eastern Ohio steel maker recently bought 2000 tons of high sulphur basic iron at around \$19, Valley furnace. Sales otherwise have been few and mostly small lots. The market now has passed through practically two months of light demand, and while shipments have been large and makers have fairly well reduced their stocks, suggestions are beginning to be heard that an inquiry of attractive size would probably bring out price concessions. A test of the market, however, is lacking. An inquiry for 1500 tons of basic iron from an Allegheny Valley steel maker is before makers, and it is possible that this will serve to prove the market. Shortage of coke has led to the banking of one Valley furnace in the past week; this furnace was not fully covered against its requirements when it was started up early this month, and with spot coke scarce and high, a suspension of production for a short time was decided on to let a supply accumulate. One of the Eliza furnaces of the Jones & Laughlin Steel Corporation recently was blown out for relining.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$20.00
Bessemer	21.00
Gray forge	20.00
No. 2 foundry	20.50
No. 3 foundry	20.00
Malleable	20.50
Low phosphorus, copper free	\$28.00 to 28.60

Ferroalloys.—Sales of ferromanganese in this district still run to small tonnages for early delivery, as most of the large users are covered by contracts, leaving the demand to come from consumers who buy small lots frequently instead of covering their requirements three to six months ahead. There seems to be no weakening of prices. On single carloads of spiegel-eisen, \$34, furnace, now is firmly quoted for average 20 per cent material; large users of this material are covered by contracts carrying lower prices. Specifications against contracts for 50 per cent ferrosilicon are coming along fairly steadily. Prices are given on page 305.

Semi-Finished Steel.—There is no longer any concern as to a possible shortage and consequently, interest in the market on the part of the non-integrated manufacturers is very low. Since January specifications for finished products have been a little below general expectations, there has not been full operation of finishing capacity, nor any pressure for deliveries of billets, slabs and sheet bars. In a month the market has changed from a condition where higher prices were confidently looked for into one where there is doubt that any considerable tonnage now could be sold at general quotations, since all consumers seem to be well covered and so little interested in additional supplies. There is a steady movement of wire rods on specifications, but not much new demand. Skelp is still easy to get at 1.90c. Prices are given on page 305.

Wire Products.—Nails are being specified with somewhat greater freedom, but the market otherwise shows no special change. Buyers have coverage against their requirements for this month and next in the form of contracts and with no indications of an early change in prices there seems to be a disposition among buyers to let the mills carry the stocks. Actual consumption is the key to business and it is early for much tonnage of wire products to be going into consumption. Effective Feb. 1, coated nails will be changed from a count to a 100-lb. keg basis. This means a new base price

and a new list of extras based on the increased weight of the keg, the average weight of count being approximately 75 lb. Prices are given on page 303.

Rails and Track Supplies.—A number of railroads are doing much more than the usual amount of winter track laying and, accordingly, there is a much larger movement of rails and track supplies than ordinarily at this time of year. Standard spikes are moving especially well and there are cases of shipments being made now that originally were specified for March and April shipment. Sales of small spikes are better than for several months. Soft coal mine resumptions brought demands that not only exhausted jobbers stocks, but gave makers some sizable backlogs. The Louisville & Nashville Railroad is taking prices on 4000 tons of tie plates. Outside of light rails, in which competition for business is still rather sharp, prices of products under this heading are firm. They are given on page 303.

Tubular Goods.—Demand for oil country pipe continues to expand because of the good drilling prospect resulting from the constant decline in oil production and the consequent firmness of oil prices. Merchant pipe is moving steadily. Prices have not changed since the recent revision of quotations on seamless casing. There is a fairly active and firm market in locomotive tubes, but the market in ordinary boiler tubes still leaves much to be desired both as to prices and sales. Discounts are given on page 303.

Sheets.—Specifications for automobile body sheets remain light, and the effort of users is still toward breaking prices. There seems to be a steady, slow gain in the specifications against contracts for the common finishes. However, the lack of automobile business, which accounts for more than a third of the total production of sheets, is not without effect upon the situation, although no success yet has attended the move toward lower body sheet prices. Mill must operate to keep down overhead and in black sheets, 3.35c., base, Pittsburgh, is being shaded to secure early delivery specifications. There has lately been considerable activity in light-gage sheets for export to Japan. Probably 30,000 tons for delivery over the next three months has been placed, much of it going to the American Sheet & Tin Plate Co. Sheet mill operations average about 85 per cent of capacity. Prices are given on page 303.

Tin Plate.—There is a demand for deliveries that, considering the time of year, is probably better defined as pressure for deliveries. Container manufacturers evidently are expecting another big year in the pack of fruits and vegetables and, having the funds to do so, are laying in larger stocks of tin plate against future requirements than usual. General line tin plate is doing well, and there have been few periods in recent years when the demand for stock items has been better than at present. Offerings of stock items are small and prices are very firm. The leading maker is heavily committed for the next 90 days and, having lately taken much light-gage sheet business which will be rolled on large tin mills, there is a possibility of starting up one of the three idle plants that in the past year have been kept ready for emergency demands.

Cold-Finished Steel Bars and Shafting.—Most makers here received good specifications last month for January delivery and in point of shipments the month has been satisfactory. Fresh specifications, however, reflect the lighter requirements of the automobile parts makers. The market is holding with much firmness, but current prices are about \$3 per ton lower than those of a year ago. On ordinary tonnages, the market is 2.50c., base, Pittsburgh.

Hot-Rolled Flats.—Reflecting the lighter operating rate of automobile builders, there has been some falling off in specifications for hot-rolled strips. Hoop and band widths also appear to be slower than they were last month, and makers are catching up with their obligations. The market is steady, with no resistance to current prices, and makers say they cannot sell for less and make a profit. Prices are given on page 303.

Cold-Rolled Strips.—Specifications are holding up well with makers in this district, and shipments are

Prices of Finished Iron and Steel Products (Carload Lots)

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills.....	2.00c.
F.o.b. Chicago.....	2.10c.
Del'd Philadelphia.....	2.32c. to 2.42c.
Del'd New York.....	2.34c. to 2.44c.
Del'd Cleveland.....	2.19c.
F.o.b. Birmingham.....	2.15c. to 2.25c.
C.i.f. Pacific ports.....	2.30c. to 2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	2.00c.
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Rail Steel

F.o.b. mill.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.00c. to 2.05c.

Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	3.00c.
Common iron, del'd Phila'phia.....	2.22c.
Common iron, del'd New York.....	2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.10c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Del'd Cleveland.....	1.99c. to 2.09c.
Del'd Philadelphia.....	2.07c. to 2.12c.
Del'd New York.....	2.09c. to 2.14c.
C.i.f. Pacific ports.....	2.30c. to 2.35c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.90c. to 2.00c.
F.o.b. Chicago.....	2.10c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Del'd Cleveland.....	2.09c. to 2.19c.
Del'd Philadelphia.....	2.22c. to 2.32c.
Del'd New York.....	2.24c. to 2.34c.
C.i.f. Pacific ports.....	2.35c. to 2.40c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh.....	2.50c.
All gages, 6 in. and wider, P'gh.....	2.30c.
All gages, 6 in. and narrower, Chicago.....	2.60c.
All gages, wider than 6 in., Chicago.....	2.50c.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.50c.
Bars, f.o.b. Chicago.....	2.50c.
Bars, Cleveland.....	2.55c.
Shafting, ground, f.o.b. mill.....	2.70c. to 3.00c.
Strips, f.o.b. Pittsburgh mills.....	3.90c.
Strips, f.o.b. Cleveland mills.....	3.90c.
Strips, delivered Chicago.....	4.20c.
Strips, f.o.b. Worcester mills.....	4.05c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.65
Galv'd nails, 1-in. and longer.....	4.65
Galv'd nails, shorter than 1 in.....	4.90
Galvanized staples.....	3.35
Polished staples.....	3.10
Cement coated nails, base, per count keg.....	1.85

Base Per 100 Lb.

Bright plain wire, No. 9 gage.....	\$2.50
Annealed fence wire.....	2.65
Spring wire.....	3.50
Galv'd wire, No. 9.....	3.10
Barbed wire, galv'd.....	3.35
Barbed wire, painted.....	3.10

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.50c.
Nos. 9 and 10, f.o.b. Ch'go dist. mills.....	2.60c.
Nos. 9 and 10, del'd Phila'phia.....	2.82c.

Box Annealed, One Pass Cold Rolled

No. 28, f.o.b. Pittsburgh.....	3.35c.
No. 28, f.o.b. Ch'go dist. mill.....	3.45c.
No. 28, del'd Phila'phia.....	3.67c.

Galvanized

No. 28, f.o.b. Pittsburgh.....	4.60c.
No. 28, f.o.b. Chicago dist. mill.....	4.70c.
No. 28, del'd Philadelphia.....	4.92c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.35c.
No. 28, f.o.b. Chicago dist. mill.....	3.45c.

Automobile Body Sheets

No. 22, f.o.b. Pittsburgh.....	4.50c.
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Long Ternes

No. 28, 8-lb. coating, f.o.b. mill.....	4.85c.
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Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.....	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....	\$11.40
8-lb. coating I.C. 11.70	25-lb. coating I.C. 17.90
15-lb. coating I.C. 14.85	30-lb. coating I.C. 19.45
	40-lb. coating I.C. 21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers	Base Per 100 Lb.
2100* (1/2% Nickel, 0.10% to 0.20% Carbon)	\$3.20 to \$3.25
2300 (3 1/2% Nickel)	4.50 to 4.60
2500 (5% Nickel)	5.70 to 5.80
3100 (Nickel Chromium)	3.50 to 3.60
3200 (Nickel Chromium)	5.00 to 5.25
3300 (Nickel Chromium)	7.00 to 7.25
3400 (Nickel Chromium)	6.25 to 6.50
5100 (Chromium Steel)	3.50
5200* (Chromium Steel)	7.00 to 7.50
6100 (Chrom. Vanadium bars)	4.20 to 4.30
6100 (Chrom. Vanad. spring steel)	3.80
9250 (Silicon Manganese spring steel)	3.20 to 3.25
Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.45 to 4.55
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2 1/2-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

Rails

Per Gross Ton

Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	\$36.00 to \$7.00
Light (from rail steel), f.o.b. mill.....	\$34.00 to \$5.00
Light (from billets), f.o.b. Ch'go mill.....	\$6.00 to \$8.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, 3/4 in. and larger.....	\$2.80 to \$3.10
Spikes, 1/2 in. and smaller.....	3.00 to 3.50
Spikes, boat and barge.....	3.25
Track bolts, all sizes.....	4.00 to 4.50
Tie plates, steel.....	2.25 to 2.35
Angle bars.....	2.75

Welded Pipe

Base Discounts f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel	Black	Galv.	Iron	Black	Galv.
Inches			Inches		
1/8.....	45	19 1/2	1/4 to 3/8.....	+11	+39
1/4.....	51	25 1/2	1/2.....	22	2
3/8.....	56	42 1/2	3/4.....	28	11
1/2.....	60	48 1/2	1 to 1 1/2.....	30	13
3/4.....	62	50 1/2			

Lap Weld

2.....	55	43 1/2	2.....	23	7
2 1/2 to 6.....	59	47 1/2	2 1/2.....	26	11
7 and 8.....	56	43 1/2	3 to 6.....	28	13
9 and 10.....	54	41 1/2	7 to 12.....	26	11
11 and 12.....	53	40 1/2			

Butt Weld, extra strong, plain ends

1/8.....	41	24 1/2	1/4 to 3/8.....	+19	+54
1/4.....	47	30 1/2	1/2.....	21	7
3/8.....	53	42 1/2	3/4.....	28	12
1/2.....	58	47 1/2	1 to 1 1/2.....	30	14
3/4.....	60	49 1/2			
1 to 1 1/2.....	61	50 1/2			

Lap Weld, extra strong, plain ends

2.....	53	42 1/2	2.....	23	9
2 1/2 to 4.....	57	46 1/2	2 1/2 to 4.....	29	15
4 1/2 to 6.....	56	45 1/2	4 1/2 to 6.....	28	14
7 to 8.....	52	39 1/2	7 to 8.....	21	7
9 and 10.....	45	32 1/2	9 to 12.....	16	2
11 and 12.....	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1 1/2 points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts f.o.b. Pittsburgh

Lap Welded Steel	Charcoal Iron
2 to 2 1/4 in.....	27
2 1/2 to 2 3/4 in.....	37
3 in.....	40
3 1/4 to 3 3/4 in.....	42 1/2
4 to 13 in.....	46
1 1/2 in.....	+18
1 3/4 to 1 7/8 in.....	+8
2 to 2 1/4 in.....	2
2 1/2 to 3 in.....	7
3 1/4 to 4 1/2 in.....	9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 to 3 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.....	60	8 in.....	45
1 1/4 to 1 1/2 in.....	52	3 1/4 to 3 1/2 in.....	47
1 3/4 in.....	36	4 in.....	50
2 to 2 1/4 in.....	31	4 1/2, 5 and 6 in.....	45
2 1/2 to 2 3/4 in.....	39		

Hot Rolled

2 and 2 1/4 in.....	34	3 1/4 and 3 1/2 in.....	50
2 1/2 and 2 3/4 in.....	42	4 in.....	53
3 in.....	48	4 1/2, 5 and 6 in.....	48

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.30%, base.....	50 to 55
Carbon, 0.30% to 0.40%, base.....	45 to 50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

fairly heavy despite the quieter condition of the automobile industry. There is close adherence to 3.90c. base Pittsburgh or Cleveland, on new business.

Steel and Iron Bars.—If there are now any sales of steel bars at above 2c., base Pittsburgh, they are of strictly retail proportions. Bar mills in this area are well engaged on old orders, but new business is not equaling shipments and pressure for specifications is heavier. Bar iron prices are steady, and there is a fairly good demand. Prices are given on page 303.

Structural Steel.—There is no longer very much insistence on advances made late last year, and the real market is 1.90c., base Pittsburgh, for large structural shapes. Instead of cancelling tonnage unspecified by the end of December, there seems to have been some extending of the contracts and that naturally has not helped sustain higher prices. Competition for fabricated steel work is keen enough to keep prices down, and this naturally is reflected in the prices that the fabricators will pay for plain material. Prices are given on page 303.

Plates.—Mills are not getting new business in proportion to completed obligations and competition for orders, particularly those of size, is increasing. There is still a quotation of 1.90c., base Pittsburgh, but 1.80c. to 1.85c. seems to be the ruling price range. Prices are given on page 303.

Bolts, Nuts and Rivets.—The situation is much as it has been for the past few weeks. Specifications are steady enough, but there is no tendency on the part of buyers to order very far ahead of actual requirements. Bolt and nut prices are well maintained, but there is some irregularity in prices of large rivets. Prices and discounts are given on page 305.

Old Material.—This market has weakened further since a week ago, and is off another 50c. a ton on the steel works grades. A Pittsburgh district steel maker has been able to get a fair-sized tonnage of open-hearth grades at \$18 for heavy melting steel, \$17 for compressed sheets, and \$16 for bundled sheet sides and ends. This business has provided a clear line on this market, since it is the first sizable transaction in several weeks and does not represent, as have so many of the recent sales, the forced sale of "distress" tonnages. There is still a quotation of \$18.50 on heavy melting steel, but it measures the price of railroad steel, or the equivalent. Continued indifference on the part of the steel manufacturers toward scrap has finally altered the ideas of dealers, who also have been influenced by the fact that January has not brought the expected gain in steel works operations. The market in two weeks has dropped \$1 a ton in the steel works grades, and that decline has carried other grades lower.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$18.00 to \$18.50
No. 1 cast, cupola size.....	17.50 to 18.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	20.50 to 21.50
Compressed sheet steel.....	17.00
Bundled sheets, sides and ends..	16.00
Railroad knuckles and couplers..	21.00 to 21.50
Railroad coil and leaf springs..	21.00 to 21.50
Low phosphorus blooms and billet ends	24.00 to 24.50
Low phosphorus plates and other material	23.00 to 23.50
Low phosphorus punchings.....	21.00 to 21.50
Railroad malleable	18.50 to 19.00
Steel car axles.....	22.00 to 22.50
Cast iron wheels.....	18.50 to 19.00
Rolled steel wheels.....	21.00 to 21.50
Machine shop turnings.....	14.50 to 15.00
Short shoveling turnings.....	15.00 to 15.50
Sheet bar crops.....	20.50 to 21.50
Heavy steel axle turnings.....	17.00 to 17.50
Short mixed borings and turnings	14.50 to 15.00
Heavy breakable cast.....	16.50 to 17.00
Stove plate	14.50 to 15.00
Cast iron borings.....	14.50 to 15.00
No. 1 railroad wrought.....	14.00 to 14.50
No. 2 railroad wrought.....	18.00 to 18.50

Coke and Coal.—While the belief is strong that the conference which started today between the hard coal miners and operators will bring a settlement of the anthracite strike, the only effect so far on the coke market has been a little more caution in purchases by

Eastern jobbers. Prices are just as high for coke for either domestic or metallurgical use as they were a week ago. The best crushed coke is selling around \$12 per net ton at Connellsville ovens, and that broken up by sledge and other means is selling from \$10.50 to \$11. Prompt furnace coke is still very scarce and producers are having no difficulty in making sales at \$9 to \$9.50. So far as is known those prices are not being paid by pig iron producers, but represent what has been paid by Eastern jobbers with facilities for breaking the coke to a domestic size. Spot foundry coke has grown even stronger since a week ago, and we note sales of selected hand-drawn 72-hr. fuel at \$10 to \$10.50. The coal market has been featured by a steep decline in slack grade, offerings of which have increased rapidly on account of the sizing of so much coal for domestic use. Steam slack, which recently was bringing as much as \$1.30 to \$1.40, in the past few days has been selling as low as \$1 per net ton at mines. Gas slack has dropped about 25c. a ton since a week ago. Prices are given on page 305.

Cut Pig Iron Freight Rates to Some Pennsylvania Points

PITTSBURGH, Jan. 25.—The recent decision of the Pennsylvania Public Service Commission ordering a reduction in the freight rate on pig iron from Sharpsville, Pa., to Grove City and Meadville, Pa., from \$1.75 per gross ton, to \$1.39, is believed here to mean a general downward revision of pig iron freight rates from Shenango and Mahoning Valley points, or at least a restoration of the former group rate, which gave blast furnaces in both valleys the same rate to common destinations. This was broken when Mahoning Valley furnaces were given a rate of \$1.26 to Canton, Ohio, and adjacent territory by the Ohio Public Utilities Commission, and as its authority did not extend to the Shenango Valley lying in Pennsylvania, furnaces in that valley were left with a freight charge of \$1.76 to the Canton district. This meant an absorption of 50c. a ton by Shenango Valley furnaces to compete with Mahoning Valley furnaces, and later also with Cleveland furnaces when the Ohio commission ordered a rate of \$1.26 from Cleveland to the Canton district.

Having a distinct bearing on the general pig iron rate situation is the recent action of the New York Central Lines and the Wheeling & Lake Erie Railway in cutting the rates from Lake furnaces to points in Ohio and Indiana. This was preceded by the action of the Norfolk & Western Railway in cutting its rates to meet the river rates from Southern Ohio to Louisville and other points. Shenango Valley furnace interests feel they are left out in the cold by recent rate concessions and are seeking relief beyond that given in the order of the Pennsylvania commission. They claim that Cleveland furnaces can get into territory that they formerly served, but that they can not get into Cleveland.

Old Material Continues to Decline at Detroit

DETROIT, Jan. 26.—There is some indication that automobile manufacturers are following their practice for the same period a year ago in holding their production in line with sales. Pig iron shipments have increased since Jan. 15. Anticipated February schedules by all melters are heavier. Due to the absence of purchasing on the part of the mills, the scrap market has continued to decline.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate. No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	\$14.25 to \$14.75
Borings and short turnings.....	10.75 to 11.25
Long turnings	10.25 to 10.75
No. 1 machinery cast.....	17.00 to 18.00
Automobile cast	23.00 to 24.00
Hydraulic compressed	13.50 to 14.00
Stove plate	13.50 to 14.50
No. 1 busheling.....	13.25 to 13.75
Sheet clippings	8.75 to 9.25
Flashings	11.25 to 11.75

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Semi-Finished Steel F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rolling, 4-in. and over.....	\$35.00
Rolling, 2-in. and smaller.....	36.00
Forging, ordinary	40.00
Forging, guaranteed	45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer.....	\$36.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger.....	\$35.00
6 in. x 2 in. and smaller.....	36.00

Skelp

	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base, No. 5 to 3/4-in.....	\$45.00
Common soft, coarser than 3/4-in.....	\$2.50 over base
Screw stock	\$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is \$46. Cleveland mill base, \$45.

Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian.....	9.50c. to 10c.
Iron ore, Swedish, average 66% iron.....	9.50c.
Manganese ore, washed, 51% manganese, from the Caucasus.....	45c.
Manganese ore, Brazilian or Indian, nominal.....	42c. to 44c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$12.50 to \$14.00
Chrome ore, Indian basic, 48% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard.....	\$22.50 to \$23.00
Molybdenum ore, 85% concentrates of MoS ₂ , New York.....	65c. to 70c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$9.00 to \$9.50
Foundry, f.o.b. Connellsville prompt	10.00 to 10.50
Foundry, by-product, Chgo ovens	10.50
Foundry, by-product, New England, del'd	13.00
Foundry, by-product, Newark or Jersey City, delivered.....	11.52
Foundry, Birmingham	5.75 to 6.50
Foundry, by-product, St. Louis or Granite City	10.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$2.10
Mine run coking coal, f.o.b. W. Pa. mines	1.90 to 2.25
Mine run gas coal, f.o.b. W. Pa. mines	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.00 to 1.15
Gas slack, f.o.b. W. Pa. mines.....	1.25

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or sea'd	\$115.00
Foreign, 80%, Atlantic or Gulf port, duty paid	115.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	\$32.00 to \$34.00
Domestic, 16 to 19%	31.00 to 33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	\$85.00
75%	145.00
	Per Gross Ton Furnace
10%	\$42.00
11%	42.00
	Per Gross Ton Furnace
12%	\$42.00
14 to 16%	\$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	<i>Per Gross Ton</i>		<i>Per Gross Ton</i>
10%	\$36.00	12%	\$40.00
11%	38.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

<i>Per Gross Ton</i>		<i>Per Gross Ton</i>	
6%	\$28.50	10%	\$34.00
7%	29.50	11%	36.00
8%	30.50	12%	38.00
9%	32.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	\$1.15 to \$1.20
Ferrocromium, 4% carbon and up, 60 to 70% Cr., per lb. contained Cr. delivered	11.50c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.25 to \$4.00
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electrolytic, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electrolytic, 24%, f.o.b. Anniston, Ala., per net ton.....	\$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$17.50
No. 2 lump, Illinois and Kentucky mines.....	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	\$17.00 to \$17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	High Duty	Moderate Duty
Pennsylvania	\$43.00 to \$46.00	\$40.00 to \$43.00
Maryland	48.00 to 50.00	43.00 to 45.00
Ohio	43.00 to 46.00	40.00 to 43.00
Kentucky	43.00 to 45.00	40.00 to 43.00
Illinois	43.00 to 45.00	40.00 to 43.00
Missouri	40.00 to 43.00	35.00 to 38.00
Ground fire clay, per ton	6.50 to 7.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$40.00
Chicago	49.00
Birmingham	54.00
Silica clay, per ton.....	\$8.00 to 9.00

Magnesite Brick

	Per Net Ton
Standard size, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	\$48.00

Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads.....	60 and 10
Machine bolts, all sizes, cut threads.....	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads	50, 10 and 10
Carriage bolts, cut threads, all sizes.....	60 and 10
Eagle carriage bolts.....	65 and 10
Lag bolts	60, 10 and 10
Plow bolts, Nos. 3 and 7 heads.....	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, 3/8 x 4 in., 45, 10 and 5	45, 10 and 5
Larger and longer sizes.....	45, 10 and 5
Bolt ends with hot-pressed nuts.....	50, 10 and 10
Bolt ends with cold-pressed nuts.....	45, 10 and 5
Hot-pressed nuts, blank and tapped, square, 4c. off list	4c. off list
Hot-pressed nuts, blank or tapped, hexagons, 4.40c. off list	4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. off list
Washers*	6.50c. to 6.25c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot-pressed and cold-pressed nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagon nuts:	
3/8 in. and smaller, U. S. S.	80, 10 and 5
1/2 in. and larger, U. S. S.	75, 10 and 5
Small sizes, S. A. E.	80, 10, 10 and 5
S. A. E., 3/8 in. and larger.....	75, 10, 10 and 5
Stove bolts in packages.....	80, 10 and 5
Stove bolts in bulk.....	80, 10, 5 and 2 1/2
Tire bolts	60 and 5

Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)					
Per 100 Net			Per 100 Net		
	S.A.E.	U.S.S.		S.A.E.	U.S.S.
1/4-in....	\$0.44	\$0.44	3/4-in....	\$2.35	\$2.40
3/8-in....	0.515	0.515	7/8-in....	3.60	3.60
1/2-in....	0.62	0.66	1-in....	5.65	5.80
5/8-in....	0.79	0.90	1 1/8-in....	8.90	8.90
3/4-in....	1.01	1.05	1 1/4-in....	12.60	13.10
7/8-in....	1.38	1.42	1 3/8-in....	18.35	18.35
1-in....	1.70	1.73	1 1/2-in....	21.00	21.00

Larger sizes.—Prices on application.

Large Rivets

Base Per 100 Lb.

F.o.b. Pittsburgh	\$2.60
F.o.b. Cleveland	2.70
F.o.b. Chicago	2.75

Small Rivets

Per Cent Off List

F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10 to 70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Milled cap screws.....	80 and 10
Milled standard set screws, case hardened.....	80
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U. S. S. thread, 80, 10 and 10	80, 10 and 10
Upset hex. cap screws, S. A. E. thread,	80 and 10
Upset set screws.....	80, 10 and 10 to 80, 10 and 5
Milled studs	70 and 5

Chicago

Outside Mills Invade Chicago District— Iroquois Stack Put Out

CHICAGO, Jan. 26.—Prices for finished steel products are a shade less firm as a result of competition between Chicago and Eastern mills. Developments of the week show neutral territory to the East and South is being crowded closer to Chicago, and in several instances, Eastern makers have quoted prices which figure back to less than the Chicago market of 2.10c. on heavy forms of finished steel. Close in, the concessions have been so small that the business has gone to Western producers. At the moment, no general reductions have been made except in the case of tie plates, which can be bought at \$2 a ton under the prices prevailing at the first of the year.

Competition in southern Illinois, Indiana and parts of Ohio is keen. Orders for plates, shapes and bars are fairly well maintained and shipping orders to date are running about equal to the average for December. Mills report that new business and specifications are exceeding shipments by a comfortable margin. New orders for rails placed here are light, but a Southern maker is reported to have booked 15,000 tons in standard sections. New business in track supplies totaled 10,000 tons, and fresh inquiries aggregate about 20,000 tons. Active inquiries for rails total close to 10,000 tons.

Railroad equipment purchases for the week include 1000 freight and 18 passenger cars, and inquiries have come out for 2300 gondola cars, 50 caboose cars and 23 coaches.

Operations of Chicago producers are unchanged at 88 per cent of ingot capacity for the leading interest and 80 to 85 per cent for the foremost independent. Steel works blast furnace output remains on the same basis as a week ago.

Merchant furnace operations in the Chicago district have been reduced by the blowing out of an Iroquois furnace. This, however, does not mean that production of merchant iron is being curtailed, for the reason that tonnage thus lost is being supplied to the trade by an Indiana Harbor furnace of the Youngstown Sheet & Tube Co. Reports are current that the Inland Steel Co. has purchased from 15,000 to 20,000 tons of pig iron from the Iroquois furnaces of the Youngstown company.

Ferroalloys.—Demand for spiegeleisen is fair, and the ruling price is \$33, Hazard, for the 16 to 19 per cent grade with no 19 to 21 per cent grade being offered. Ferromanganese is quiet at \$115, Seaboard, or \$122.56, delivered. The market for 50 per cent ferrosilicon is very quiet.

We quote 80 per cent ferromanganese, \$122.56, delivered Chicago; 50 per cent ferrosilicon, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$41.76, delivered Chicago.

Pig Iron.—With the blowing out during the week of an Iroquois furnace the active list of merchant stacks now stands as follows: two Federal, two Iroquois, one Mayville, the Thomas and the Zenith furnace. The curtailment of operations at the Iroquois works is compensated for by the fact that merchant iron is being obtained from one of the Indiana Harbor furnaces of the Youngstown Sheet & Tube Co. Shipments, which are said to equal production, are moving forward in slightly greater volume than during December. Producers assert that furnace stocks have not grown to any appreciable extent, but that they are better balanced. The demand for spot iron has improved within the last few days, and Northern No. 2 foundry is firm at \$23. Charcoal iron is more active, and a number of sales are reported at the market price of \$29.04, delivered. Silvery and low phosphorus are quiet and quotations are unchanged. Southern iron is more active, and several sales are reported at \$23, base Birmingham, or \$27.18, delivered by rail and barge. An inquiry is now before the market for 500 tons for delivery over the first and second quarters. A few

carloads of Soo iron have been sold in northern Michigan and Wisconsin.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	\$23.00
Northern No. 1 foundry, sil. 2.25 to 2.75	23.50
Malleable, not over 2.25 sil.	23.00
High phosphorus	23.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (all rail)	\$27.01 to 28.01
Southern No. 2 (barge and rail)	26.18 to 27.18
Low phos., sil. 1 to 2 per cent, copper free	31.20 to 31.70
Silvery, sil. 8 per cent.	35.29
Ferrosilicon, 14 to 16 per cent.	48.79

Sheets.—Specifications for sheets have shown a slight improvement during the week, but makers admit that buyers as a rule are slow in making their wants known. As a result, mills have curtailed operations somewhat. Chicago quotations are holding at 3.50c. for black, 2.65c. for blue annealed, and 4.75c. for galvanized.

Chicago delivered prices from mill are 3.50c. for No. 28 black, 2.65c. for No. 10 blue annealed and 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4.10c. base for black, and 5.25c. base for galvanized.

Bars.—Bookings of soft steel bars are about equal to the average maintained during December. Specifications are not quite so heavy, but are still running ahead of shipments. Reports are insistent that mills outside of the Chicago district are meeting local makers' prices. In fact, a quotation recently made in Milwaukee is said to have been on the basis of 20c. a ton less than the Chicago mill price of 2.10c. Demand for bar iron has eased off, and makers report that prompt deliveries can now be made, as against two weeks' shipments in December. Inquiry, however, is fairly active, and mills expect substantial orders to be placed soon. Practically all users of rail steel bars are specifying freely, and mill operations are unchanged. Fence post makers are busy, and shipments are moving freely on contracts placed last fall. Indications are that jobbers look for a good spring trade in posts, since prompt shipment demands are now being received from as far north as the Dakotas. Concrete reinforcement is still taking a good tonnage of rail steel, both on fall contracts and business recently placed.

Mill prices are: Mild steel bars, 2.10c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 2c. to 2.05c., Chicago.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c., Chicago warehouse.

Rails and Track Supplies.—Actual orders for rails and track supplies are not heavy, although inquiry is said to be in substantial volume. A local maker has booked 8000 tons of tie plates and 2000 tons of angle bars. The Southern Pacific is said to have placed 10,000 tons of rails with the Tennessee Coal, Iron & Railroad Co., and the Missouri-Kansas-Texas has distributed 10,000 tons as follows: 5500 tons to the Tennessee company and 4500 tons to the Illinois Steel Co. and the Inland Steel Co. The Burlington is expected to enter the market soon for 7000 tons of tie plates and 3000 tons of splice bars. The Minneapolis, St. Paul & Sault Ste. Marie will inquire soon for 10,000 tons of 110-lb. rails and 5000 tons of tie plates. The past week has seen a weakening in the price of tie plates, which are now quoted at 2.25c. to 2.35c.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, \$36 to \$38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c., mill; track bolts with square nuts, 3.90c. to 4c., mill; steel tie plates, 2.25c. to 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of Chicago warehouse at 3.55c., base, and track bolts, 4.55c., base.

Cast Iron Pipe.—Bids recently received at Milwaukee were as follows: Glamorgan Pipe & Foundry Co. was low on 3000 tons of 4, 6, 8, 12 and 16-in. Class C pipe with a price of \$47.40 per ton delivered. The United States Cast Iron Pipe & Foundry Co. bid \$47.50; James B. Clow & Sons, \$49.50; the National Cast Iron Pipe Co., \$50, and the American Cast Iron Pipe Co., \$50.50. The freight rate from Birmingham to Milwaukee is \$8.50, making the base price of the low bidder \$38.90, Birmingham. The National Cast Iron Pipe Co. has taken the following business: 1600 tons for Downers' Grove, Ill.; 750 tons for Kenosha, Wis., and 2500 tons for Dearborn, Mich. Dearborn also placed 700 tons with the United States Cast Iron Pipe & Foundry Co. Albion, Ill., is inquiring for 700 tons of miscellaneous sizes of pipe.

We quote per net ton, delivered Chicago, as follows: Water pipe, 4-in., \$54.20; 6-in. and over, \$48.20 to \$50.20; Class A and gas pipe, \$4 extra.

Bolts, Nuts and Rivets.—Small rivets are said to be holding at 70 and 10 to 70 and 5 per cent off list. Other prices remain steady and unchanged. Makers' operations throughout the industry are well up to the 75 per cent mark. Specifications are liberal, and are being received from widely diversified industries.

Jobbers quote structural rivets, 3.50c. per lb.; boiler rivets, 3.70c. per lb.; machine bolts up to $\frac{3}{8}$ x 4 in., 50 and 5 per cent off; larger sizes, 50 and 5 off; carriage bolts up to $\frac{3}{8}$ x 4, 47½ off; larger sizes, 47½ off; hot-pressed nuts, square, tapped or blank, \$3.25 off; hot-pressed nuts, hexagon, tapped or blank, \$3.75 off; coach or lag screws, 55 and 5 per cent off.

Wire Products.—Specifications from the manufacturing trade are fairly liberal, and in view of numerous requests for prompt shipments, it is believed that products going out through this channel are being steadily absorbed by production. Jobbers throughout the Central and Southern portions of the country are specifying freely, and new business is said to be well sustained. The present demand is early, considering the time of the year, and mills believe that jobbers are building up stocks. Mill operations have increased and are now close to 75 per cent of capacity. The extras on cement coated nails have not yet been announced. Prices, which are a trifle firmer, are shown on page 303.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.30 per 100 lb.; common wire nails, \$3.05 per keg; cement-coated nails, \$2.05 to \$2.20 per count keg.

Structural Material.—A local mill has booked 7000 tons of plain material during the week, although construction programs are progressing rather slowly. Contracts placed with fabricators were few in number and small in tonnage. Of late, shops have been taking on a number of small jobs on which very prompt shipment was demanded. Chicago weather remains open and projects in the course of erection are moving upward with little loss of time.

The mill quotation on plain material is 2.10c. Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Plates.—A Chicago mill has booked 25,000 tons of plates, shapes and bars for cars contracted for during the week. The Illinois Central has issued inquiries for 2300 gondola cars and 40 caboose cars. About 70 tank cars have recently been placed, and a western refining company is taking prices on 500 tank cars. Although plates are still quoted at 2.10c., Chicago, there is an undercurrent of weakness, due largely to reports that Eastern makers are crowding the boundaries of neutral territories and are making close prices in southern Illinois, Indiana and parts of Ohio.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Reinforcing Bars.—The outstanding award of the week was 1100 tons for a warehouse and service station for the Commonwealth Edison Co., Chicago. Otherwise contracts were few and small in tonnage. There are still a fair number of inquiries, particularly for apartment buildings and hotels. Dealers' bar stocks are low because of the deflation of supplies prior to inventory taking. Shops are still busy and operating forces are about equal to those of December. Reports are per-

sistent that rerolled bars will be used in Illinois road work during the coming year. The program as now contemplated will require between 15,000 and 20,000 tons. Billet steel reinforcing bars are steady at 2.60c., Chicago warehouse. Contracts recently awarded, and new inquiries are shown on page 315.

Coke.—Shipments are moving forward at an unchanged rate and just about balance production. Prices remain at \$10.50, district ovens, or \$11, delivered in the Chicago switching district.

Billets.—This commodity is in good demand and is firm at \$35 per gross ton, Chicago, for 4-in. and larger sizes.

Sheet Bars.—Demand is well sustained and quotations are unchanged at \$36 per gross ton, Chicago.

Old Material.—The tendency of the market is again downward and heavy melting steel is quoted at \$14.75 to \$15.25, with very little of the material being taken by users. There are evidences that many country and some city dealers are disinclined, in the face of a market which gives no indication of gathering strength, to hold their stocks longer. Moreover, it is said that financial pressure is forcing liquidation on many dealers already more than adequately supplied with all grades of materials. At any rate, the fact remains that the Chicago market is weaker because of a continued influx of scrap and a consistent postponement of purchases by users, who are pressing the situation to their own advantage. In some quarters it is stated that dealers feel they can well afford to take a loss at the present market and restock from the extensive lists which are expected from the railroads in the spring. Cast borings are weaker, and a small tonnage was taken by a large steel maker at \$13.50. Advertised lists of the railroads include 7200 tons offered by the St. Paul, 2600 tons by the Santa Fe and 1500 tons by the Monon.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

Per Gross Ton	
Iron rails	\$18.00 to \$18.50
Cast iron car wheels.....	18.00 to 18.50
Relaying rails, 56 lb. to 60 lb....	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels.....	18.50 to 19.00
Railroad tires, charging box size	19.00 to 19.50
Railroad leaf springs, cut apart..	19.00 to 19.50
Rails for rolling.....	17.50 to 18.00
Steel rails, less than 3 ft.....	18.50 to 19.00
Heavy melting steel.....	14.75 to 15.25
Frogs, switches and guards, cut apart	17.00 to 17.50
Shoveling steel	14.75 to 15.00
Drop forge flashings.....	11.50 to 12.00
Hydraulic compressed sheets....	13.00 to 13.50
Axle turnings	15.00 to 15.50
Steel angle bars.....	18.00 to 18.50
Steel knuckles and couplers.....	18.00 to 18.50
Coil springs	19.00 to 19.50
Low phos. punchings.....	17.25 to 17.75
Machine shop turnings.....	9.25 to 9.75
Cast borings	13.00 to 13.50
Short shoveling turnings.....	13.00 to 13.50
Railroad malleable	18.00 to 18.50
Agricultural malleable	16.50 to 17.00

Per Net Ton	
Iron angle and splice bars.....	16.50 to 17.00
Iron arch bars and transoms....	21.00 to 21.50
Iron car axles.....	26.00 to 26.50
Steel car axles.....	17.50 to 18.00
No. 1 busheling.....	12.00 to 12.50
No. 2 busheling.....	9.25 to 9.75
Pipes and flues.....	11.00 to 11.50
No. 1 railroad wrought.....	13.50 to 14.00
No. 2 railroad wrought.....	13.25 to 13.75
No. 1 machinery cast.....	17.00 to 17.50
No. 1 railroad cast.....	16.25 to 16.75
No. 1 agricultural cast.....	16.25 to 16.75
Locomotive tires, smooth.....	16.50 to 17.00
Stove plate	14.75 to 15.25
Grate bars	13.50 to 14.00
Brake shoes	13.00 to 13.50

"Thermal Expansion of Tungsten" is the title of Scientific Paper No. 515 of the Bureau of Standards. The authors are Peter Hidnert and W. T. Sweeney of the staff of the bureau. The expansion is studied over various temperature ranges between -100 and +500 deg. C.

St. Louis

Wabash Buys Tie Plates—Coke Demand Remains Strong

ST. LOUIS, Jan. 26.—The first inquiry for second quarter delivery of pig iron—1000 to 1500 tons of foundry grade for a machinery manufacturer—was issued during the week, but men in the trade are uncertain as to whether it is a genuine inquiry or merely an effort to establish a price for inventory purposes. The only other inquiry before the market is for 200 tons for prompt shipment to another machinery maker. Both melt and shipments continue heavy in this district. Sales during the week, all for prompt delivery, amounted to about 600 tons, in carload lots up to 100 tons. The market is strong at unchanged prices.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$4.42 from Birmingham, all rail, and \$1c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25...	\$25.66
Northern malleable, sil. 1.75 to 2.25	25.66
Basic	25.66
Southern fdy., sil. 1.75 to 2.25	\$26.42 to 27.92
Granite City iron, sil. 1.75 to 2.25 ..	24.31 to 24.81

Coke.—The demand for coke continues strong. Colder weather and the anthracite situation have brought a large domestic trade to by-product ovens in this district. Foundries are busy, and there is a good call, therefore, for industrial grades of coke.

Finished Iron and Steel.—The Wabash Railway has placed orders for 1,000,000 tie plates. It is understood that about 500,000 went to the Illinois Steel Co., 280,000 to the Inland Steel Co., both of Chicago, and 100,000 to the Scullin Steel Co., but no information is available as to the distribution of the remainder. Fabricators report that greater interest is being shown in building, and that some good-sized projects are in the air.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.60c.; galvanized sheets, No. 28, 5.70c.; black corrugated sheets, 4.65c.; galvanized, 5.75c.; cold-rolled rounds, shafting and screw stock, 3.75c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{3}{4}$ -in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 and 5 per cent; lag screws, 55 $\frac{1}{2}$ per cent; hot-pressed nuts, square, \$3.25 off list; hexagon, blank or tapped, \$3.75 off list.

Old Material.—Railroads have been offering more material than the market can absorb, and consumers in the district are buying hardly anything, with the result that scrap shows further weakness, and prices are lower. Railroad lists include the following: Baltimore & Ohio, 15,000 tons; Atchison, Topeka & Santa Fe, 2700 tons; Gulf Coast Lines, 725 tons; St. Louis Southwestern, 700 tons, and Louisiana & Arkansas, 500 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$13.50 to \$14.00
Rails for rolling	16.75 to 17.25
Steel rails less than 3 ft.	17.75 to 18.25
Relaying rails, 60 lb. and under ..	24.00 to 25.00
Relaying rails, 70 lb. and over ..	30.00 to 31.00
Cast iron car wheels	18.00 to 18.50
Heavy melting steel	14.75 to 15.25
Heavy shoveling steel	14.75 to 15.25
Frogs, switches and guards cut apart	16.50 to 17.00
Railroad springs	19.00 to 19.50
Heavy axles and tire turnings ..	11.75 to 12.75
No. 1 locomotive tires	16.50 to 17.00

Per Net Ton	
Steel angle bars	14.50 to 15.00
Steel car axles	17.50 to 18.00
Iron car axles	23.00 to 23.50
Wrought iron bars and transoms ..	19.00 to 19.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.00 to 13.50
Cast iron borings	10.75 to 11.25
No. 1 busheling	11.50 to 12.00
No. 1 railroad cast	15.00 to 15.50
No. 1 machinery cast	17.00 to 17.50
Railroad malleable	14.00 to 14.50
Machine shop turnings	7.00 to 7.50
Bundled sheets	8.00 to 8.50

Boston

Scrap Prices Unsettled but Iron Remains Steady—Coke Supplies Tightening

BOSTON, Jan. 26.—Little new has developed in the pig iron market. Current sales continue in small quantities, largely for filling in or mixture purposes for first quarter delivery, with a small percentage running into April and May. Concerted buying for second quarter has yet to develop. Numerous melters are sounding out the market, but open inquiries of more than 300 tons are scarce. One melter is considering the purchase of 900 tons of second quarter iron, but is not pressed for it and consequently is undecided. Virtually all large melters have 1000 to upwards of 5000 tons due them, which accounts for the lack of interest in second quarter iron. In addition, the New England melt has decreased, rather than increased, during the past week or ten days. Buyers, in some instances, state they can secure Buffalo iron at price concessions, but have nothing definite to base their contentions on. Three lots of iron, held by banking interests are collateral, have been sold at slight concessions, but they hardly are an indication of the market. Pig iron prices actually are steady.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	\$26.15 to \$26.65
East. Penn., sil. 2.25 to 2.75	26.65 to 27.15
Buffalo, sil. 1.75 to 2.25	25.91 to 26.91
Buffalo, sil. 2.25 to 2.75	26.41 to 27.41
Virginia, sil. 1.75 to 2.25	29.92
Virginia, sil. 2.25 to 2.75	30.42
Alabama, sil. 1.75 to 2.25	31.60 to 32.60
Alabama, sil. 2.25 to 2.75	32.10 to 33.10

Coke.—Flurries in coke prices elsewhere caused by contradictory reports regarding the status of the anthracite strike, have been conspicuously absent in New England. A greater demand for domestic fuel, as a result of more seasonable weather, and a tightening up of supplies overshadow all outside market factors. Prices are firm, and no more than firm. Both the New England Coal & Coke Co. and the Providence Gas Co. are again so completely sold up on domestic fuel that it is necessary to discriminate in accepting new business. The supply of foundry coke is also tighter, although New England ovens continue to make fairly prompt shipments on contract specifications. New England made by-product foundry coke remains at \$13 a ton, delivered, within a \$3.10 freight rate zone. Coke imports have slumped, not more than 3006 tons (Scotch), having been landed in Boston in January to date.

Cast Iron Pipe.—Boston opened bids Jan. 26 on 2500 tons of 8-in. to 36-in. pipe and on 200 tons of special sizes. Stoneham, Mass., also closed bids on that date, but for a much smaller tonnage. No municipal lettings of importance were made the past week, but pipe companies say private business on common, as well as gas, pipe continues active. One of the local utility companies has privately placed 4000 to 5000 tons of gas pipe and fittings. French pipe representatives were the low bidders for the 250 tons of 6-in. to 12-in. pipe for Malden, Mass., but no award has been made. Price concessions on 16-in. and larger pipe are still obtainable, but quotations on smaller sizes are steady. Prices openly quoted on pipe follow: 4-in., \$60.10 a ton, delivered common Boston freight rate points; 6-in. to 16-in., \$56.10; 20-in. and larger, \$55.10. The usual extra of \$5 is asked on Class A and gas pipe.

Old Material.—Scrap prices are unsettled as a result of a lack of business, since most dealers have filled old contracts. Dealers who heretofore paid \$12 to \$12.50 a ton on cars for heavy melting steel, today cannot do better than \$11.50. There are dealers, however, who can still pay as high as \$12.50, but only on selected material. Eastern Pennsylvania is about the only section to which heavy melting steel can be shipped today. A Rhode Island mill is holding up deliveries, while a Worcester, Mass., mill will accept only railroad steel. Dealers who heretofore paid slightly better than \$10

for machine shop turnings and common cast iron borings, today quote \$9.50 a ton or less, while mixed borings and turnings, heretofore \$9.60, are now \$9 flat. The best some dealers can do on stove plate for eastern Pennsylvania shipment is \$9.60. Holders are reluctant to sell at that price. Recent sales include a fair tonnage of heavy cast at \$15 to \$15.50, on cars eastern Massachusetts, and 1½-in. to 6-in. shafting, which brought \$18 to \$18.50. Most dealers cannot pay as much for shafting, however. The market for pipe is dead. Recent shipments to Pennsylvania were rejected, and prices had to be adjusted \$1 to \$2 a ton.

The following prices are for gross-ton lots delivered consuming points:

Textile cast	\$20.00 to \$20.50
No. 1 machinery cast.....	19.50 to 20.00
No. 2 machinery cast.....	15.50 to 16.50
Stove plate	14.00 to 14.50
Railroad malleable	19.50 to 20.00

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$11.50 to \$12.50
No. 1 railroad wrought.....	13.25 to 13.50
No. 1 yard wrought.....	12.00 to 12.50
Wrought pipe (1 in. in diameter, over 2 ft. long).....	11.50 to 11.75
Machine shop turnings.....	9.00 to 9.50
Cast iron borings, chemical.....	11.50 to 11.75
Cast iron borings, rolling mill.....	9.00 to 9.50
Blast furnace borings and turnings	9.00 to 9.50
Forged scrap	10.00 to 10.25
Bundled skeleton, long.....	10.00 to 10.25
Forged flashings	10.00 to 10.25
Bundled cotton ties, long.....	8.50 to 9.00
Bundled cotton ties, short.....	10.00 to 10.25
Shafting	17.50 to 18.50
Street car axles.....	17.50 to 18.00
Rails for rerolling.....	13.25 to 13.50
Scrap rails	11.50 to 12.50

Birmingham

Second Quarter Buying of Pig Iron—Large Structural Projects

BIRMINGHAM, Jan. 26.—Buying for the second quarter of the year has started and prospects are bright for substantial sales. One company sold 9000 tons of foundry on the first announcement that its books had been opened for that period, at \$23 per ton, base Birmingham. The larger consumers have not as yet come into the market, but it is believed that the melt for the second quarter will be fully as heavy as during the current quarter. Inquiries are more numerous. The larger users in this territory have good prospects for the second quarter, and little iron so far bought will be carried over into that period. Part of the inquiries pending are from outside of the home territory. Furnaces are making an effort to maintain production. The only blast furnace scheduled for resumption in the near future is that of the Central Iron & Coal Co. at Holt, and only a portion of its output will be offered on the open market. Spot demand is not so active as it has been, though consumers who have been buying iron for from one to three weeks ahead are apparently booking forward business. Prices still range from \$22 to \$23 per ton, Birmingham, for No. 2 foundry, but the higher figure is being asked on the bulk of business now pending.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil....	\$22.00 to \$23.00
No. 1 foundry, 2.25 to 2.75 sil....	22.50 to 23.50
Basic	22.00
Charcoal, warm blast.....	30.00 to 32.00

Rolled Steel.—Practically all of the steel fabricating plants of this section are employed at capacity and have promise of sufficient work to warrant active operation for several months to come. Local requirements are keeping some of the fabricating shops busy. Plans have been approved on a 17-story hotel building in which structural steel will be used, and drawings have been completed for a 20-story hotel. Florida and other sections in the South are still placing specifications for large tonnages of structural steel. The Corporation mills are said to be booked ahead in some lines until well toward the end of the year. Soft steel bars are

quoted at 2.15c. to 2.25c., base Birmingham, and tank plates and structural shapes at 2.05c. to 2.15c.

Cast Iron Pipe.—Lettings of cast iron pressure pipe have declined recently, but unfilled tonnage is sufficient to warrant heavy production and steady shipments. The Southeast and the Far West are taking considerable pipe. The outlook for spring business is promising.

Coke and Coal.—Both coke and coal are strong. All mines are operating at capacity, transportation service is good, and demand continues to pile up. Labor is apparently satisfied and has responded to the pressure for increased output. Demand for coke is active. One company has sold 30,000 tons of nut coke for Chicago delivery. Independent producers are selling their make for weeks ahead and iron and steel companies with coke operations are participating in current sales of domestic fuel. Quotations on foundry coke range from \$5.75 to \$6.50, Birmingham.

Old Material.—Large quantities of old material are moving, with the melt steady. Quotations remain unchanged. Dealers have contracts which will call for deliveries for 60 to 90 days.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	14.00 to 14.50
Railroad wrought	13.00 to 13.50
Steel axles	19.00 to 20.00
Iron axles	18.00 to 19.00
Steel rails	14.00 to 14.50
No. 1 cast.....	17.00 to 17.50
Tramcar wheels	17.00 to 17.50
Car wheels	16.00 to 16.50
Stove plate	14.00 to 14.50
Machine shop turnings.....	8.00 to 8.50
Cast iron borings.....	8.00 to 8.50
Rails for rolling.....	17.50 to 18.00

Buffalo

Pig Iron Inquiry Better—New Business in Steel Recedes

BUFFALO, Jan. 26.—Pig iron inquiry totals around 6000 tons. The General Electric Co. is seeking 1500 tons of foundry and malleable and the American Locomotive Co. has placed 2500 tons of foundry and 400 tons of charcoal. Other pending business includes several lots of 500 and 1000 tons and many of 100 tons. Prices still range from \$21 to \$22, base furnace, for first quarter, with two of the furnaces adhering definitely to \$22 and two asking \$21. The second quarter quotation on No. 2 plain foundry is \$21, but inquiry for that delivery is not specially good. Differentials for silicon are being obtained and prices seem to be strong.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$21.00 to \$22.00
No. 2X foundry, sil. 2.25 to 2.75....	21.50 to 22.50
No. 1 foundry, sil. 2.75 to 3.25....	22.50 to 23.50
Malleable, sil. up to 2.25.....	21.00 to 22.00
Basic	20.50 to 21.00
Lake Superior charcoal.....	29.25

Finished Iron and Steel.—Operations keep up a high gait in district mills, but new business is not so heavy as it was earlier in the month. Wire business is good, with the demand general for the various grades and sizes. The structural market has picked up, and fabricators are becoming more active. The city of Buffalo has placed a contract for 860 tons for a park museum, and a theater, requiring 150 tons, is being erected in Kensington. Bars are still 2.265c. per lb., Buffalo, and sheet prices remain firm at 3.35c. and 4.60c., base Pittsburgh, for black and galvanized, respectively.

Warehouse prices are being quoted as follows: Steel bars, 3.30c. per lb.; steel shapes, 3.40c.; steel plates, 3.40c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized, 5.75c.; cold-rolled shapes, 4.45c.; cold-rolled rounds, 3.95c.; wire nails, 3.90c.; black wire, 3.90c.

Old Material.—Consumption of scrap is now as heavy as during the 1925 peak, and dealers' stocks are beginning to taper. One mill is buying heavy melting steel continuously at \$17, but a small tonnage of heavy melting was sold to another mill recently at \$18.50. It is probable that a mill coming into the market for tonnage within the next week would pay \$18, at least, for strictly No. 1 heavy melting steel. There is little

buying of specialties. Some low phosphorus has been sold around \$20, and angle bars and special foundry scrap at \$19.50. Small sales of cast have been made at \$17.50. One of the largest consuming mills of the district is expected in the market during the next week or ten days.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$17.00 to \$18.00
Low phosphorus	19.50 to 20.00
No. 1 railroad wrought	16.50 to 17.00
Car wheels	17.50 to 18.00
Machine shop turnings	13.50 to 14.00
Mixed borings and turnings	14.00 to 14.50
Cast iron borings	14.00 to 14.50
No. 1 busheling	17.50 to 18.00
Stove plate	15.00
Grate bars	14.50 to 15.00
Hand-bundled sheets	13.00 to 13.50
Hydraulic compressed	17.50 to 18.50
No. 1 machinery cast	17.00 to 17.50
Railroad malleable	20.00 to 21.00
No. 1 cast scrap	17.50 to 18.00
Iron axles	26.00 to 27.00
Steel axles	20.00 to 21.00

Cincinnati

Interest Shown in Second Quarter Pig Iron—Steel Buying Lags

CINCINNATI, Jan. 26.—Buyers of pig iron are beginning to show interest in second quarter iron, and sales in the past week have totaled more than 7000 tons. While few general inquiries have been put out, there is a disposition on the part of many consumers to make purchases quietly. Producers in the Ironton district are aggressively soliciting business over the first half of the year at \$21, base, Ironton. While Tennessee iron is quoted at \$22, base, Birmingham, little of it has been sold in this territory. Alabama furnaces are still out of the market and have not set a price for second quarter shipments. Malleable grades have been moving more freely at \$21, base, Ironton. Silvery iron is quiet. A central Ohio melter has contracted for 1000 tons of malleable, and the Wickham Piano Plate Co., Springfield, Ohio, has taken a like tonnage. The International Harvester Co. has bought 500 tons of foundry iron for its Springfield, Ohio, plant. An inquiry for 1500 tons of foundry iron for shipment over the last three quarters of the year has aroused unusual interest. Sellers agree that it is hazardous to accept such an order at a set price, in view of the uncertainty of coke prices and of a possible increase in the cost of ore. The Worthington Pump & Machinery Corporation is expected to buy 450 tons of foundry and Bessemer iron for second quarter delivery to its local plant. The Kokomo Steel & Wire Co., Kokomo, Ind., has closed for 200 tons of spiegeleisen. Shipments of iron from southern Ohio furnaces have attained satisfactory proportions in the past two weeks.

Based on freight rates of \$3.69 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	\$25.69
Alabama fdy., sil. 2.25 to 2.75	26.19
Tennessee fdy., sil. 1.75 to 2.25	25.69
Southern Ohio silvery, 8 per cent	32.77
Southern Ohio fdy., sil. 1.75 to 2.25	23.27
Southern Ohio, malleable (nominal)	23.27

Finished Material.—Reluctance of consumers to buy more than they need for immediate requirements has had a detrimental effect upon sales. Industrial companies feel that prices will not advance, and consequently they are pursuing a watchful waiting policy, purchasing only material that is absolutely necessary. Stocks of consumers are low and are likely to remain in that condition during the next month at least. Sellers, however, report that there is a steady flow of small orders and that the tonnage in the aggregate is satisfactory. Bars have settled definitely to a level of 2c., base, Pittsburgh, although efforts are still being made to secure 2.10c. Structural shapes range from 2c. to 2.10c., base, Pittsburgh, but the latter price applies only in isolated cases. Sales of plates have been confined to numerous lots ranging from 25 to 75 tons, with 1.90c., base, Pittsburgh, the prevailing price. Specifications and orders for galvanized sheets have been consistently

good at 4.60c., base, Pittsburgh, and a good demand for blue annealed sheets has further strengthened the price of 2.50c., base, Pittsburgh. Activity in black sheets has been moderate, and quotations are firm at 3.35c., base, Pittsburgh. Bookings of wire goods have fallen off, and sellers are less optimistic than they were several weeks ago. Jobbers have sufficient stock to carry them over the next month. River shipments of nails continue to be heavy, several attractive tonnages having been shipped by barge to Cincinnati and Louisville consumers. Common wire nails are selling at \$2.65 per keg, Pittsburgh or Ironton, and plain wire at \$2.50 per 100 lb., Pittsburgh or Ironton. The number of fresh structural jobs has dropped off somewhat in the past two weeks but fabricators are fairly busy on small lettings.

Reinforcing Bars.—The market is exceedingly quiet, and there is no indication of an improvement in the immediate future. Prices, however, remain firm, with new billet bars bringing 2c., Cleveland, and rail steel bars 1.90c., mill.

Tin Plate.—Several can makers are reported to have closed for their first half requirements in the past week. Others, who have postponed buying, are expected to contract for considerable tonnages when they attend the canners' convention in Louisville the coming week. Tin plate is steady at \$5.50 per base box, Pittsburgh.

Warehouse Business.—The volume of business in the past week has been disappointing. The decrease in orders is attributed principally to the cold and the snow, which have hampered outdoor activities. Quotations are unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.30c. per lb.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c. to 4.30c.; No. 28 galvanized sheets, 5.25c. to 5.40c.; No. 9 annealed wire, \$3 per 100 lb.; common wire nails, \$2.95 per keg base; cement coated nails, \$2.25 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes, prices net per 100 ft.: lap-welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Coke.—An advance of 50c. a ton on by-product domestic coke has been announced. The new schedule calls for \$9.14, delivered Cincinnati. Connellsville coke has gone so high that it has been automatically eliminated as a factor in the local market. The result has been considerable activity in Wise County furnace and foundry grades. The demand for domestic coke has exceeded the supply and in some cases dealers have been unable to quote on attractive inquiries because all of the available tonnage had been sold. By-product foundry is expected to remain at \$10.64, delivered Cincinnati, during February. Three sales of beehive coke, totaling 600 tons, have been made locally.

Based on freight rates of \$2.14 from Ashland, Ky., \$3.53 from Connellsville, and \$2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Connellsville foundry, \$9.53 to \$10.53; Wise County foundry, \$9.09; New River foundry, \$9.59 to \$10.59; by-product foundry, \$10.64.

Old Material.—The market is sluggish. With Portsmouth, Ohio, mills refusing to accept shipments and other consumers well stocked for immediate needs, few sales have been made. Prices remain the same, although they are weak.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	\$14.00 to \$14.50
Scrap rails for melting	14.00 to 14.50
Short rails	18.00 to 18.50
Relaying rails	27.00 to 27.50
Rails for rolling	15.50 to 16.00
Old car wheels	13.50 to 14.00
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.50 to 15.00
Loose sheet clippings	9.50 to 10.00
Champion bundled sheets	11.00 to 11.50

Per Net Ton	
Cast iron borings	9.00 to 9.50
Machine shop turnings	7.50 to 8.00
No. 1 machinery cast	19.50 to 20.00
No. 1 railroad cast	15.50 to 16.00
Iron axles	23.00 to 23.50
No. 1 railroad wrought	11.50 to 12.00
Pipes and flues	9.00 to 9.50
No. 1 busheling	10.00 to 10.50
Mixed busheling	9.00 to 9.50
Burnt cast	9.50 to 10.00
Stove plate	10.50 to 11.00
Brake shoes	10.50 to 11.00

New York

Heavier Purchases of Pig Iron—Dead Center in Steel Demand

NEW YORK, Jan. 26.—Pig iron demand is gathering momentum, but buying is still limited largely to first quarter needs. The rapidity with which recent inquiries have been closed and the pressure for deliveries which has followed the placing of orders reflects a nervous condition of the market. The uncertainty of the fuel situation no doubt caused buyers to defer purchases for current needs, just as it is still delaying action on second quarter requirements. At the moment the coke market is sentimentally weaker because of the resumption of conferences between miners and operators. Pig iron prices are substantially unchanged. Foreign iron is still offered at \$21.50 to \$22.50, duty paid port of entry, although furnaces abroad are said to have announced advances of 50c. to \$1 a ton. The Crane Co. has closed for 1500 tons of German iron for its Bridgeport plant, and A. Weiskittle & Sons Co., Baltimore, has bought 1000 tons of German foundry. Of sales through New York brokers during the week, however, a large proportion of the total of more than 10,000 tons was domestic iron. A leading seller, for example disposed of 6000 tons, of which 4500 tons was domestic. Prominent among recent transactions was a purchase of 2500 tons of foundry and 400 tons of charcoal by the American Locomotive Co. for its Schenectady plant. The General Electric Co., which was inquiring for 1500 tons of foundry for Elmira, N. Y., and 300 tons for Bayway, N. J., is understood to have bought. The only second quarter business pending is an inquiry from the Worthington Pump & Machinery Corporation for a total of 1200 tons, which calls for deliveries throughout the first half to its Holyoke, Mass., Buffalo, N. Y., and Elmwood Place, Ohio, plants. The Richmond Radiator Co. is in the market for 400 tons of foundry for spot shipment to its Norwich, Conn., works. The American Tube & Stamping Co., Bridgeport, Conn., denies the recent purchase of 6000 tons of Indian basic iron.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25	\$25.02 to \$25.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	25.52 to 26.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	26.02 to 26.52
Buffalo fdy., sil. 1.75 to 2.25	25.91 to 26.91
No. 2 Virginia fdy., sil. 1.75 to 2.25	29.54

Ferroalloys.—There is an inquiry for 900 tons of ferromanganese from a large Western steel company which has already purchased close to 1000 tons in the last two or three months. The inquiry for 300 to 600 tons, which was before the market last week, is still pending so far as can be learned. There continues to be inquiry and sales for small and carload lots with the price unchanged. Sales of spiegeleisen are noted amounting to about 1500 tons, for delivery mostly in the first half, with inquiries aggregating from 300 to 500 tons. Quotations for this alloy continue firm. Specifications on contract for the higher grade ferrosilicons and for standard ferrochromium are large, but very little new business is being negotiated.

Finished Iron and Steel.—Interest in the local steel trade is centered on lines of activity that are usually depended upon to bring new tonnage to the mills, such as structural steel work, car and locomotive building, oil pipe lines, etc. Such projects have developed very slowly since the first of the year. Structural steel lettings in this district are at a low point, although many new projects are under consideration. Plate tonnage has fallen off and current orders are mostly in small lots up to a carload. New business in all lines is coming out slowly. However, consumption is going on at a good rate and manufacturing consumers are taking all of the tonnage that is due them and in some cases are urging quicker shipments. On that side the market shows no tendency to lag, but the absence of new

projects of size in various lines of fabrication is beginning to cause surprise. Prices hold reasonably well, except in the case of black sheets, on which cuts of \$2 a ton are still reported. Plates seem to be fairly firm at 1.80c., Pittsburgh, from Eastern mills, but an attractive tonnage might bring concessions of \$1 a ton. Structural shapes remain at 1.90c. to 2c., Pittsburgh, while on steel bars there seems to be no variation from 2c., Pittsburgh.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c. per lb.; plates, 2.09c. to 2.14c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.24c.

Warehouse Business.—There has been a slight improvement in the number of orders placed in the past week, but tonnages are still small. Prices continue firm and unchanged. Black and galvanized sheets are still quoted as low as 4.35c. and 5.35c. per lb. respectively, higher prices being applicable only to the smallest lots. Prices on zinc sheets are unchanged, despite the general expectation of a slight decline and the additional factor of lower spelter prices. Prices on page 332. We quote boiler tubes per 100 ft., as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Old Material.—Prices on all grades are lacking in strength and plenty of material is obtainable at the lower level of offering. Mills show no inclination to make further purchases and brokers are rapidly fulfilling contracts. No. 1 heavy melting steel is being purchased at \$16 to \$16.50 per ton, delivered eastern Pennsylvania consumers. Cast borings, machine shop turnings, and borings and turnings are off from 25c. to 50c. per ton in the buying prices. Few brokers are paying more than \$14 per ton delivered on steel mill stove plate. Stove plate for foundries in this district is being shipped to Bayonne, West Mahwah, N. J. and Bridgeport, Conn. Heavy breakable cast is slightly lower, brokers paying not to exceed \$17 per ton delivered to a Harrisburg user and about \$17.50 to Florence, N. J.

Buying prices per gross ton, New York, follow:

Heavy melting steel (yard)	\$11.00 to \$11.50
Heavy melting steel (railroad or equivalent)	12.75 to 13.25
Rails for rolling	13.50 to 14.00
Relaying rails, nominal	23.00 to 24.00
Steel car axles	19.75 to 20.25
Iron car axles	24.50 to 25.00
No. 1 railroad wrought	14.50 to 15.00
Forge fire	10.50 to 11.00
No. 1 yard wrought, long	14.00 to 14.50
Cast borings (steel mill)	10.00 to 10.25
Cast borings (chemical)	14.00 to 14.50
Machine shop turnings	10.00 to 10.50
Mixed borings and turnings	10.50 to 11.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate (steel mill)	10.25 to 10.75
Stove plate (foundry)	11.25 to 11.75
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	16.50 to 17.50
Cast iron car wheels	14.00 to 14.50
No. 1 heavy breakable cast	13.25 to 14.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	\$18.00 to \$18.50
No. 1 heavy cast (columns, building material, etc.), cupola size	16.50 to 17.00
No. 2 cast (radiators, cast boilers, etc.)	15.50 to 16.00

Coke.—The upward movement of last week has been maintained, partly as a result of the heavy demand for domestic coke and partly because of the car shortage and an insufficiency of scales to weigh out loaded cars. The heavy movement of coke in recent months, it is pointed out, has taken most of the large hopper cars out of the Connellsville district and operators are being forced to use smaller gondola cars. Demand for foundry coke is small and but little furnace business is reported. Both grades are quoted at \$9.75 to \$10.25 per ton, while domestic sizes range from \$11.50 to \$12.50 per ton, with as high as \$13 per ton paid in some instances. By-product is unchanged at \$11.52 delivered Newark or Jersey City, N. J.

Cast Iron Pipe.—There is still a large volume of private purchasing of gas pipe, but only a few municipal lettings of water pipe. The recent inquiry

of Malden, Mass., for about 600 tons was placed with the Warren Foundry & Pipe Co. and Wayland, Mass., in the market for about 1400 tons of 6-in. to 12-in. water pipe, made a ward to the same company. Soil pipe continues inactive with discounts unchanged.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$52.60; 4-in. and 5-in., \$55.60 and \$57.60; 3-in., \$65.60 to \$67.60; with \$5 additional for Class A and gas pipe. Discounts both of Northern and of Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 42½ to 43¼ per cent off list; heavy, 52½ to 53¼ per cent off list.

Youngstown

Large Sale of Pig Iron—Steel Output Drops With Decline in Buying

YOUNGSTOWN, Jan. 26.—With a slackening in buying of some forms of finished steel, there has been a corresponding decline in the activities of rolling mills in this area. Last week 117 sheet mills started, but the number declined to 100 before the week-end. This week 115 of the 127 in the Mahoning Valley were scheduled to start, but it was acknowledged that there would be curtailments before the end of the weekly period. Sheet makers, however, feel that the spotty condition in the market will be corrected within the next 30 days.

Average operations of steel plants have sagged to an 85 to 87 per cent rate, as compared with a 90 per cent production maintained until recent weeks.

In general, steel buying still exhibits the effects of year-end slackening and seems somewhat slower than usual in recovering.

Of 53 independent open-hearth furnaces, 42 are producing ingots this week. Tube mill output is at 65 per cent; plate mills are running at 60 per cent. Strip, tin plate and merchant steel bar capacity is being operated at close to a normal rate.

The Republic Iron & Steel Co. is operating all of its steel bar mills in the Youngstown district, but has only four tube mills under power.

Steel Pipe.—Much of the current output of the pipe mills, especially in the lapweld sizes, is going into mill stocks or into the warehouses of jobbing interests, which in some cases are subsidiaries of the producers. For instance, the Youngstown Sheet & Tube Co. is building up and balancing the stocks of the Continental Supply Co., St. Louis, a subsidiary engaged in distribution in the South and Southwest, primarily of steel tubes but also of heavy plates, sheets, and other materials used in connection with oil well developments.

Pig Iron.—The Youngstown Sheet & Tube Co. has sold at current market quotations 15,000 tons of pig iron, for delivery over the next few months from its Iroquois blast furnace in the Chicago district to the Inland Steel Co., Chicago. Pig iron is now being produced in the Youngstown district at an average rate of 70 per cent of capacity, with 27 of the 42 blast furnaces in operation. Two of the stacks included in the active list, however, are banked, one in the Shenango Valley of the Reliance Coal & Coke Co. and a stack in the group of three at New Castle, Pa., of the Carnegie Steel Co. The inactive furnace next to go in blast will likely be No. 3 in the Ohio works group at Youngstown of the Carnegie company. This stack is now being rebuilt.

The Carnegie company is now operating ten furnaces in the district, including five at the Ohio works, three at New Castle, Pa., one of which is banked for a week for repairs, and two at the Farrell, Pa., works. The Youngstown Sheet & Tube Co. has six stacks in action, three at the East Youngstown works, two at Brier Hill and one at Hubbard. The Republic Iron & Steel Co. is operating four and the Shenango Furnace Co. two. Other active stacks in the district include one each operated by the Trumbull Cliffs Furnace Co., Struthers Furnace Co., Sharon Steel Hoop Co., Sharpsville Furnace Co. and the United Iron & Steel Co.

Coke.—The Struthers Furnace Co., Struthers, Ohio, H. W. Grant, receiver, is in the market for additional tonnages of beehive coke, to supplement original contracts. The company is receiving current coke shipments at \$4 per ton under contract.

Pressed Steel.—Fabricators with the exception of the General Fireproofing Co. are experiencing seasonal slackening in buying and in production. The Truscon Steel Co., the Youngstown Pressed Steel Co., the Automatic Sprinkler Co. and other similar interests are operating at reduced rates.

Cleveland

Alloy Steel Declines—Sheets Unsteady—Coke Situation Tighter

CLEVELAND, Jan. 26.—Mills are getting a fair volume of specifications on contracts for finished steel, but the market lacks snap, as there is very little new buying. The automotive industry generally covered late last year for its steel requirements for the first few weeks of this year or the first quarter, and is cautiously limiting specifications to early requirements. Motor car production has increased somewhat the past week, but the policy of the industry seems to be to limit output to the number of cars the market can absorb. Some of the makers of automobile parts are operating at good production schedules, although a number of the makers of automobile stampings are not very busy. It has developed that the order for parts recently placed by the Hudson Motor Car Co. was for 150,000 cars.

The delivery situation shows virtually no change. Most mills can make fairly early shipments, although some are eight or 10 weeks behind on small bars and small shapes. Some plate consumers who want quick deliveries have switched orders from their regular sources of supply to mills able to make shipments promptly. Interest in the structural market is centered in the Cleveland Union Terminal Co. work, requiring approximately 20,000 tons, for which bids will be taken Feb. 1. Steel bars are firm at 2c., Pittsburgh. Plates are unchanged at 1.85c. to 1.90c., Pittsburgh, with some orders going at 1.80c. On structural material 1.90c. is the more common price except for small lots.

Jobbers quote steel bars, 3.10c. per lb.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.25c.; cold-rolled rounds and hexagons, 3.90c.; flats and squares, 4.40c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3 per 100 lb.; No. 9 galvanized wire, \$3.45 per 100 lb.; common wire nails, \$3 base per keg.

Pig Iron.—Foundries are showing little interest in second quarter contracts and furnaces are not making much effort to push sales for that delivery. Cleveland producers during the week sold 8000 tons of foundry and malleable iron, mostly in small lots, partly for the second quarter and partly for the current quarter. Some furnaces have practically no iron to offer for the present quarter. While shipping orders are good, the demand for iron on contracts is not in the heavy volume at which it was moving several weeks ago. There appears to be no tendency toward higher or lower prices, although a decrease in production, due to the blowing out and banking of furnaces evidently with the view of selling coke at the present high prices, is reducing the possibility of output in excess of the demands. The Bourne-Fuller Co., Cleveland, has blown out its Upson furnace, having accumulated a surplus of pig iron for its early requirements. Cleveland furnaces quote foundry and malleable iron at \$22, furnace, for local delivery and \$21 for outside shipment. Other Lake furnace prices range from \$22.50 to \$23, furnace, the latter being the prevailing price in Michigan. The Valley price is unchanged at \$20.50, furnace. The prevailing Lake furnace prices are not low enough to

meet Valley and southern Ohio competition in certain sections of central and western Ohio.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6.01 from Birmingham:

Basic, Valley furnace.....	\$20.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25..	\$22.26 to 22.50
Southern fdy., sil. 1.75 to 2.25....	28.01
Malleable	22.26 to 22.50
Ohio silvery, 8 per cent.....	33.52
Standard low phos., Valley furnace	27.50 to 28.00

Semi-Finished Steel.—With the slowing down in the demand for sheets, specifications for sheet bars are rather light, and there is no new demand, since consumers are well covered with contracts. Supplies are available at \$36 for sheet bars and small billets, and \$35 for slabs and large billets. The McKinney Steel Co. has started three additional open-hearth furnaces, now operating seven out of 14.

Sheets.—Definite offers of a \$2 a ton concession on automobile body sheets to 4.40c., Pittsburgh, have reached some of the Detroit automobile manufacturers. However, most of the mills appear to be holding to the price of 4.50c., at which they have contracts. There is very little new sheet business, and specifications on first quarter contracts are not keeping up to shipments. Unless the demand improves soon, some of the mills will need orders. Black sheets are still weak, and on some of the full-finished material there is an irregularity in prices resulting from shading of extras, concessions of as much as \$3 a ton being reported. Blue annealed sheets are firm, but there are indications that a market test would show concessions on galvanized sheets.

Strip Steel.—Mills are getting a fair volume of specifications for hot-rolled strip steel, but new business is light and some of the mills are getting well caught up on orders. Most of the cold-rolled strip mills are comfortably filled with orders. Regular prices appear to be holding.

Reinforcing Bars.—Although new billet steel reinforcing bars are regularly quoted at 2c., Pittsburgh, competition with rail steel bars is resulting in some price shading. Rail steel bars are unchanged at 1.80c. to 1.90c. at mill.

Alloy Steel.—Weakness has developed in the market, evidently because some of the mills are in need of tonnage. Concessions of \$2 a ton are being made on 3.5 per cent nickel steel and on nickel chromium steel, Series 3100, the two grades representing the bulk of the tonnage from the automobile industry. These prices developed in Detroit late last week. Ohio mills have not revised their price schedules and are still asking the minimum prices that they have recently been quoting, but a Pittsburgh district mill has announced a new price schedule making general reductions.

Bolts, Nuts and Rivets.—Specifications on bolt and nut contracts continue to come out in fair volume, and makers are operating their plants at 75 per cent of capacity. Prices are firm. Demand for large rivets is moderate. Small rivets are moving in very good volume and are somewhat firmer, with most business except for large lots going at 70 and 10 per cent discount.

Iron Ore.—Stocks of Lake Superior ore at furnaces and on docks Jan. 1 amounted to 36,898,684 gross tons, as compared with 36,359,975 tons on the same date a year ago. Furnace stocks on Jan. 1 amounted to 29,817,382 tons. Ore consumed in December, as shown by the monthly report of the Lake Superior Iron Ore Association, was 4,964,515 tons as compared with 4,554,377 tons in November. Central district furnaces last month consumed 2,730,475 tons, a gain of 317,675 tons over November. Lake front furnaces consumed 1,993,727 tons, a gain of 69,446 tons. Eastern furnaces consumed 123,477 tons, a gain of 20,125 tons, and all-rail furnaces consumed 116,836 tons, a gain of 2892 tons.

On Dec. 31 there were 194 furnaces in blast using Lake ore, a gain of 10 for the month.

Coke.—The coke situation has become tighter. Prices have advanced further to \$11, Connellsville, for foundry coke, and some foundries not under contract have paid that price on car lots. Connellsville foundry heating coke is quoted at \$12, ovens. Ohio by-product foundry coke is being sold in all the quantities available at \$11.50 per ton, ovens, for domestic purposes. Some West Virginia foundry coke is coming into this territory, selling at \$6 ovens, and carrying a freight rate of \$3.65. The contract price for Painesville by-product foundry coke for February shipment has been set at \$8.50 ovens, or the same as for January.

Old Material.—The market is weaker and as yet shows no signs of recovery from the slump of the past month. Heavy melting steel has declined 50c. and blast furnace scrap 25c. a ton. Mills are not buying, and there is little demand from dealers for materials to cover short sales. Not a great deal of distress material is being offered. Dealers are paying \$17.50 for heavy melting steel and \$14.60 to \$14.75 for borings and turnings for Canton delivery and \$17 for compressed steel for Warren delivery. The Dodge Brothers, Inc., Detroit, will receive bids Jan. 27 on a larger scrap list than usually comes from that automobile plant. The list aggregates about 6500 tons, including 1200 tons of borings, 1150 tons of flashings, 2500 tons of turnings and 1550 tons of compressed sheet steel.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$16.00 to \$16.50
Rails for rolling.....	16.75 to 17.00
Rails under 3 ft.....	19.50 to 20.00
Low phosphorus melting.....	18.25 to 18.50
Cast iron borings.....	13.25 to 13.50
Machine shop turnings.....	13.25 to 13.50
Mixed borings and short turnings	13.25 to 13.50
Compressed sheet steel.....	15.50 to 16.00
Railroad wrought	14.50 to 15.00
Railroad malleable	20.00 to 20.50
Light bundled sheet stampings...	12.50 to 12.75
Steel axle turnings.....	15.25 to 15.50
No. 1 cast.....	18.00 to 18.50
No. 1 busheling.....	13.50 to 13.75
Drop forge flashings.....	13.25 to 13.50
Railroad grate bars.....	13.75 to 14.00
Stove plate	13.75 to 14.00
Pipes and flues.....	11.50 to 12.00

Philadelphia

Business Quiet in All Lines with Slight Increase in Steel Buying

PHILADELPHIA, Jan. 26.—No marked change from the quiet which settled upon the iron and steel market about the first of the year has occurred, though there has been within the past week a moderate increase in the volume of new steel orders and specifications against contracts. However, steel tonnage is falling below the December record. Structural steel lettings, which should soon begin to increase in preparation for spring construction, are in light volume, this having been the situation throughout the entire month. Most of the new steel tonnage that has come to light in the past week emanates from railroad purchases of cars and other equipment. The American Brown Boveri Electric Corporation, formerly the New York Shipbuilding Corporation, ordered 3000 tons of plates and 1150 tons of shapes for four barges to be built for the New York Central Railroad. The Lenoir Car Works, Lenoir City, Tenn., a subsidiary of the Southern Railway, is in the market for 2000 tons of plates and 1800 tons of shapes for car work, and the Pennsylvania Railroad has ordered 1500 tons of plates from an Eastern mill for locomotive tenders which will be built by the Baldwin Locomotive Works.

Scrap buyers have dropped out of the market almost entirely and trading has been left to brokers and dealers, with declines in prices on nearly all grades. The only market for heavy melting steel is brokers who have steel mill orders and these brokers are paying

only \$16 to \$16.50, delivered. This is a decline of \$1.50 a ton this month.

Pig Iron.—Aside from a sale of 5000 tons of basic iron, there have been no transactions of importance in pig iron. The market is very quiet. At least one furnace is making quotations of \$22.50, furnace, on No. 2 plain, and \$23 on No. 2X, which is 50c. a ton under the nominal quotations of other furnaces, which, however, have little or nothing to sell. The delivered price of iron at Philadelphia is not affected by the \$22.50 quotation, as the furnace making this price has a freight rate to this city which makes its delivered price equal to a \$23, furnace, price from stacks nearer by. Foreign iron is still an important factor in the market, last week's receipts having been more than 6500 tons, most of which was sold before arrival. Prices on foreign iron continue to range from \$19.50 to \$22, depending on the analysis. In single carloads some sales are being made at slightly higher figures, sometimes as high as \$23, Philadelphia.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$23.76 to \$24.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.26 to 24.63
East. Pa. No. 1X, 1.75 to 2.25 sil.	24.76 to 25.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic, delivered eastern Pa.	23.00 to 23.50
Gray forge	23.00 to 23.50
Malleable	24.00 to 25.00
Standard low phos. (f.o.b. furnace)	23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	24.00

Ferroalloys.—Current buying of ferromanganese is confined to occasional carload lots. There is no change of price, \$115 being quoted on both foreign and domestic metal.

Plates.—The largest plate order in this district in weeks has been placed by the American Brown Boveri Electric Corporation, Camden, N. J., for four barges to be built for the New York Central Railroad. These barges take 3000 tons of plates, together with 1150 tons of shapes. Next in size is an order placed by the Pennsylvania Railroad for 1500 tons for 100 locomotive tenders to be built by the Baldwin Locomotive Works. Eastern mills are quoting on 2000 tons of plates and 1800 tons of shapes for the Lenoir Car Works, but it is expected that the business will go to a Pittsburgh or Birmingham mill. Plates remain fairly firm at 1.80c., Pittsburgh, on current orders, though many contract customers are receiving shipments at prices from \$2 to \$4 a ton lower. Deliveries range from two to five weeks, depending on the mill.

Structural Steel.—Structural steel lettings have been in much less volume this month than last, but the mills are receiving liberal specifications against contracts closed in the fourth quarter. Current orders not covered by contract are relatively few; nevertheless an Eastern mill which is able to make better deliveries than its competitors reports an increase in tonnage in the last week. Prices remain fairly firm at 1.90c. to 2c., Pittsburgh, the higher price applying only on small lots, while on unusually attractive orders 1.90c. is occasionally shaded, but such concessions appear to be less frequent.

Bars.—Specifications against January quotas of first quarter bar contracts are coming to the mills more freely than in the first half of the month, but considerable tonnage is yet to be specified before Feb. 1. As nearly all consumers of bars and jobbers are well covered on contract, there is very little new buying. The price remains firm at 2c., Pittsburgh. A few thousand tons of foreign bars and some shapes has been sold by a Philadelphia importer for shipment into Florida. The bars are to be of German origin and the shapes will come from Belgium. The price at which the bars were sold was 1.90c. at dock, duty paid.

Sheets and Tin Plate.—Except for continued reports of occasional shading on black sheets, the sheet market presents a fairly firm front. Galvanized and blue annealed sheets seem to be stronger than black. Tin mill

black plate has been sold as low as 3.20c., Pittsburgh. Some mills have advanced the price of stock tin plate to \$5, but it is still obtainable at \$4.75 from others.

Warehouse Business.—Local warehouses announce a price reduction on steel and iron bars and hoops and bands, which have been subject to price cutting for some weeks. The range on steel bars is 3c. to 3.20c., although sales are being made occasionally at 2.85c. For local delivery prices are quoted as follows:

Soft steel bars and small shapes, 3c. to 3.20c. per lb.; iron bars (except bands), 3c. to 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel, planished, 4.30c.; tank steel plates, ¼-in. and heavier, 2.80c. to 3c.; tank steel plates, ⅜-in., 3c.; blue annealed steel sheets, No. 10 gage, 3.50c.; black sheets, No. 28 gage, 4.65c.; galvanized sheets, No. 28 gage, 5.85c.; square twisted and deformed steel bars, 3c.; structural shapes, 2.75c. to 2.90c.; diamond pattern plates, ¼-in., 5.30c.; ⅜-in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 4c.; squares and flats, cold-rolled steel, 4.50c.; steel hoops, 4c. to 4.25c.; base: steel bands, No. 12 gage to ⅜-in., inclusive, 3.75c. to 3.90c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

Imports.—Imports of pig iron last week, totaling 6561 tons, came from the following sources: India, 2471 tons; Germany, 1000 tons; Alsace, 2490 tons; the Netherlands, 600 tons. Other imports were: Iron ore from Spain, 181 tons; ferromanganese from Germany, 100 tons; structural steel, 160 tons from Belgium and 32 tons from Germany; steel bars, 123 tons from France and 50 tons from Belgium; steel blooms, 662 tons from France; hoop steel from Belgium, 18 tons; galvanized steel strips from England, 5 tons.

Old Material.—All buyers of heavy melting steel scrap in the eastern Pennsylvania district have dropped out of the market, some having covered their requirements for several weeks, and trading in the past week has been left entirely in the hands of those brokers who have orders to fill. They are paying \$16 to \$16.50, delivered at mill for steel scrap of good quality and nothing higher is obtainable anywhere in the East. Other grades have weakened in sympathy or because buyers, sensing the decline in values, have withheld purchases. Shipments of scrap have exceeded the demand. One mill received a few days ago 50 carloads of turnings for which no orders had been placed and these were taken in at \$14 a ton. The decline in steel scrap has been fully \$1.50 a ton since the market began to weaken and other grades have dropped 50c. to \$1.50. Weakness at Pittsburgh, where sales were made today at \$18, has also affected the Eastern market.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	\$16.00 to \$16.50
Scrap rails	16.00 to 16.50
Steel rails for rolling	18.00 to 18.50
No. 1 low phos., heavy, 0.04 per cent and under	21.00 to 22.00
Couplers and knuckles	20.00 to 21.00
Rolled steel wheels	20.00 to 21.00
Cast iron car wheels	17.50 to 18.00
No. 1 railroad wrought	18.00 to 18.50
No. 1 yard wrought	16.50 to 17.00
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	14.00
Mixed borings and turnings (for blast furnace)	13.50 to 14.00
Machine shop turnings (for steel works)	14.00
Machine shop turnings (for rolling mill)	14.50
Heavy axle turnings (or equivalent)	15.00
Cast borings (for steel works and rolling mill)	14.00 to 14.50
Cast borings (for chemical plant)	16.50 to 17.00
No. 1 cast	18.00 to 18.50
Heavy breakable cast (for steel works)	17.00 to 17.50
Railroad grate bars	14.50
Stove plate (for steel works)	14.50
Wrought iron and soft steel pipes and tubes (new specifications)	16.50
Shafting	22.00 to 23.00
Steel axles	22.00 to 23.00

The Institute of Metals (British) increased its membership last year from 1571 to 1692. Such progress is regarded as remarkable at a time of acute depression in the engineering and metal trades and as indicating that manufacturers are anxious to avail themselves of the latest scientific knowledge with a view to meeting foreign competition.

Simplification in Concrete Bars

Spirited Meeting Votes to Have Committee Ascertain What Grades Are Most Desirable

WASHINGTON, Jan. 26.—Adoption of a resolution asking that a committee be appointed by the Department of Commerce to survey, through the proper channels of production, distribution and consumption, what grade or grades of new billet concrete reinforcing steel are most desirable was the outcome of a spirited meeting held here today with Secretary of Commerce Hoover under the auspices of the National Committee on Metals Utilization.

The conference, attended by about 50 representatives of rolling mills, consumers, distributors, technical bodies and other interested organizations, was called for the purpose of considering initial steps looking to reduction of the 57 existing variations in specifications for billet steel reinforcing bars. The committee, to be selected by W. C. Wetherill, director of the metals utilization committee, who presided, will be required to conduct a referendum among users, distributors and producers, and to report at a general conference to be held soon after Oct. 1.

The decision to select the committee, made upon motion of George E. Routh, Jr., of the Kalman Steel Co., Chicago, actually came about as a compromise made necessary by conflicts of opinion. The differences expressed at the meeting at times became sharp and chiefly represented the variance in views of makers and distributors of bars rolled from new billets on the one hand and makers and distributors of rail steel bars on the other. Some consumers also were opposed to what they thought, along with the rail steel bar interests, was a plan to eliminate all but the intermediate grade of new billet bars.

Certain representatives of technical societies also cautioned against elimination of all but one grade of new billet bars until tests proposed to determine actual requirements are made. As yet these tests have not been begun and the conference was indisposed to await their outcome, which, it was said, would require at least one year.

It was pointed out by those representing rolling mills and distributors of new billet bars that the specifications considered related only to this class of bars and therefore did not affect rail steel bars. Interests associated with the rail steel bar industry, however, made it plain that they were apprehensive lest elimination of structural and hard bar grades of new billet steel would adversely affect their interests. There actually was no recommendation made, however, to reduce grades of new billet bars to the intermediate or any other single standard.

A. E. Lindau, chairman of the committee on grades of reinforcing steel and standard sizes of the Concrete Reinforcing Steel Institute in opening the discussion, outlined the position of the institute. He said that the simplification of specifications offers a potential saving of \$5,000,000 a year to the construction industry. Reviewing the growth of the new billet reinforcing bar industry, he said that the consumption has increased from 80,000 tons 20 years ago to 700,000 tons a year at present. He said approximately 100,000 tons are carried in stock to meet the present demand for new billet bars. He also said many factors are at work to slow down the rate of increase in consumption of this class of bars but urged standardization as a means of reducing the necessary stocks that will have to be increased unless such a course is adopted.

Reduction in Sizes of Spiral Rods

At another meeting today, held under the auspices of the division of simplified practice, with E. W. Ely, presiding, recommendations that four sizes of steel spiral rods be used for reinforced concrete columns to replace 11 sizes now in use were adopted. The report was presented by Mr. Lindau, who said that the recommendations were based on exhaustive studies by the Concrete Reinforcing Steel Institute. The conference voted that the recommendations become effective Dec.

15 of the current year and that existing stocks of the old sizes shall be cleared, if possible, by March 1, 1927. The new sizes will remain in effect, it was voted, until changing conditions shall necessitate the calling of another general revision conference. Mr. Lindau said that the matter of reduction of grades could well be undertaken for consideration at a later meeting.

REINFORCING STEEL

Contracts Awarded Include 2000 Tons for Atlanta Job and 1100 Tons for Chicago

Concrete reinforcing steel awards of the week, totaling about 5300 tons, are swelled by a 2000-ton project in Atlanta, Ga., and a Chicago warehouse taking 1100 tons. Awards follow:

Firestone Tire & Rubber Co., Akron, Ohio, 100 tons, to Bourne-Fuller Co.

Cleveland Union Terminal Co., Cleveland, depot foundations, 175 tons, to Jones & Laughlin Steel Corporation.

Central Place apartment, 321 North Central Avenue, Chicago, 150 tons of rail steel, to Calumet Steel Co.

Commonwealth Edison Co., warehouse at Twenty-second Street and Throop Avenue, Chicago, 1100 tons, to Truscon Steel Co.

Bridge at Rockford, Ill., 300 tons, to Kalman Steel Co.

Public Service Co. of Northern Illinois, addition to Waukegan power plant, 150 tons, to Jones & Laughlin Steel Corporation.

Allied Building, Ogden Avenue and Wood Street, Chicago, 140 tons of rail steel, to Inland Steel Co.

Sidney Wanzer Dairy Co., Chicago, 100 tons, to Kalman Steel Co.

Sears, Roebuck & Co., Atlanta, Ga., building, 2000 tons, to Kalman Steel Co.

Sewer project, Brooklyn, N. Y., 500 tons, P. J. Carlin Construction Co., New York, general contractor, to European mill.

Merit Hosiery Co., Woodhaven, Long Island, building, 200 tons, to Concrete Steel Co.

George Inness junior high school, Montclair, N. J., 100 tons, to Concrete Steel Co.

Subway section, New York, 200 tons, placed by Mason Contracting Co. with McClintic-Marshall Co.

Duff-Nash Motor Co., Philadelphia, building, 100 tons, to McClintic-Marshall Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

Rogers Park Hospital, Chicago, 100 tons.

Northwestern University, Chicago, Meyer Law School and Gary Library, 105 tons.

Apartment building, 424 Melrose Avenue, Chicago, 600 tons; McNally & Quinn, architects.

Maremont Mfg. Co., Sixteenth Street and Ashland Avenue, Chicago, 165 tons; Holperin & Braun, architect.

Procter & Gamble Co., Port Ivory, Staten Island, additional buildings, 400 tons, making a total of 500 tons pending at that plant.

Bethlehem Merger Hearings at Pittsburgh

PITTSBURGH, Jan. 26.—Hearings in the Bethlehem merger case were begun here yesterday before Examiner McCorkle of the Federal Trade Commission. It was indicated that they will continue here for possibly three weeks. B. B. Bane, attorney of the commission, is being assisted by Hugh E. White, traffic analyst of the commission. The hearings here are similar to those previously held and consist of examination of consumers of iron and steel in an effort to show that the absorption by the Bethlehem Steel Co. of the Midvale properties and the Lackawanna Steel Co. has restricted competition in the steel trade.

"Some Economic Aspects of Industrial Relations," a paper by A. H. Young, industrial relations counsel for Curtis, Fosdick and Belknap, New York, will be presented at a dinner meeting of the New York Chapter of the Society of Industrial Engineers, to be held at the Cafe Boluevard, New York, Feb. 2. Discussion of the paper will be led by H. L. Davis, director of technical employment and training, New York Telephone Co.

FABRICATED STEEL

Awards Total Close to 23,000 Tons, but New Projects Are in Light Volume

Included in structural steel awards totaling nearly 23,000 tons in the week are three of fairly good size: 6650 tons for a City Hall in Los Angeles, 4000 tons for steel barges for a steel company, and 3500 tons for a New York loft building. New projects as reported total about 13,000 tons. Awards follow:

The Structural Steel Board of Trade of New York reports the following jobs totaling 2562 tons of steel having been taken by members during the past week: B. W. Axelrod office building, 113 West Forty-second Street, New York, to Drier Iron Works; office building at 1-3 East Forty-second Street, New York, to Post & McCord; storehouse for New York Edison Co., to Post & McCord; church and parsonage at Ridgewood, Long Island, and storage warehouse for Tremmer's brewery, New York, to Reiche & Penner, Inc.; loft building at Varick and Charlton Streets, New York, to Hay Foundry & Iron Works.

Loft building, Twenty-ninth Street, New York, tonnage not stated, to Hadden Iron Construction Co.

Loft building, Eighth Avenue and Thirty-sixth Street, New York, about 3500 tons, to Levering & Garrigues Co.

Hood Rubber Co., Watertown, Mass., building No. 61, 100 tons, to A. L. Smith Iron Works, Chelsea, Mass.

City of Buffalo, museum for Humboldt Park, 860 tons, to Buffalo Structural Steel Co.

Bickford Theater, Kensington, Buffalo, 150 tons, to Buffalo Structural Steel Co.

Carnegie Steel Co., 25 steel barges, 4000 tons, to American Bridge Co.

Steel frame for transit shed berth, Los Angeles Harbor Department, 500 tons, to Virginia Bridge & Iron Co.

Mead Morrison Mfg. Co., coal handling bridge, location not given, 400 tons, to Milwaukee Bridge Co.

United Verde Copper Co., Clarkdale, Ariz., concentrator building, 800 tons, to McClintie-Marshall Co.

Commonwealth Edison Co., Chicago, service building, 300 tons, to Vierling Steel Works, Chicago.

Kansas, Oklahoma & Gulf Railway Co., bridge at Muskogee, Okla., 175 tons, to Wisconsin Bridge & Iron Co.

Gas holder at Waukegan, Ill., 800 tons, to Bartlett Hayward Co.

City Hall, Los Angeles, 6650 tons, to McClintie-Marshall Co.

Hawaiian Electric Co., Honolulu, building, 550 tons, to California Steel Co.

Garfield School, Oakland, Cal., 200 tons, to Herrick Iron Works.

Reservoir tanks, Oswego, Ore., 100 tons, to Pittsburgh-Des Moines Steel Co.

Stand pipe, Gresham, Ore., 100 tons, to Pittsburgh-Des Moines Steel Co.

City of Carmichael, Cal., 300 tons, to Sacramento Pipe Works.

Baldwin Locomotive Works, Philadelphia, plant addition, 550 tons.

Bulck Motor Car Co., Flint, Mich., 300 tons, to Flint Structural Steel Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Chester Lace Mills, Chester, Pa., 250 tons.

New York subways, section 8, route 78, 1600 tons; bids close Feb. 5.

State of Virginia, highway bridge, 850 tons.

High Bridge, New York, reconstruction work previously reported, 3000 tons, is to be readvertised by the city of New York.

Garage, Brookline, Mass., 200 tons.

Y. M. C. A., Portland, Me., 150 tons.

Ohio State Savings Association, Columbus, Ohio, 1500 tons; general contract to D. W. McGrath & Sons Co.

Building, Charleston, S. C., 1500 tons.

Crane Co., Chicago, building, 500 tons.

Missouri Highway Commission, Jefferson City, Mo., highway bridge project, 540 tons, awards Feb. 5.

United Verde Copper Co., Clarkdale, Ariz., 1000 tons.

Parke, Davis & Co., Detroit, administration building, 500 tons.

New York Central grade crossing elimination at Erie, Pa., 2000 tons; bids taken.

Halle Brothers store, Cleveland, 2500 tons.

RAILROAD EQUIPMENT

Illinois Central Enters the Market for 2300 Freight Cars—Buying Totals 1881 Cars

Another week of moderate buying of railroad equipment brought orders totaling only 1881 cars. There were two orders for 500 cars each and one of 401 cars, the others being small lots. The Illinois Central has come into the market for 2300 freight cars and there is other business pending, recently reported, which may be closed soon.

Fewer cars were in need of repair on Jan. 1 than at any time in two years, according to reports from Class I railroads to the Car Service Division, American Railway Association. The total number was 157,405 or 6.8 per cent of the number on line. This was a decrease of 2807 from the number reported as of Dec. 15. Locomotives in need of repair on Jan. 1 totaled 9769 or 15.4 per cent of the number on line, a decrease of 983 compared with the Dec. 15 figure.

The principal equipment items of the week follow:

The Standard Steel Car Co. has received an order for 40 milk cars from the Delaware, Lackawana & Western.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered 500 box cars from the Pullman Car & Mfg. Corporation.

The Northern Refrigerator Car Co. has ordered 500 refrigerator cars from the Pullman Car & Mfg. Corporation.

The Pennsylvania Railroad has ordered 100 locomotive tenders from the Baldwin Locomotive Works.

The New York, New Haven & Hartford has ordered 5 electric passenger locomotives and 3 switching engines, to cost about \$1,000,000, from the Westinghouse Electric & Mfg. Co.

The Chicago & North Western placed 250 ballast cars with the American Car & Foundry Co., 250 underframes with the Western Steel Car Co., and 250 underframes with the Ryan Car Co.

The Florida East Coast has purchased 40 cabooses from the Mount Vernon Car & Mfg. Co.

The Wichita Falls & Southern purchased 50 box cars from the American Car & Foundry Co.

The Chicago & North Western placed 225 sets of miscellaneous car superstructures with the General American Car Co. and a like number with the Illinois Car & Mfg. Co.

The Illinois Central is inquiring for 2300 gondolas and 40 cabooses.

The Burlington has ordered 25 passenger car underframes from the Bettendorf Co.

The Independent Oil & Refining Co., Tulsa, Okla., has ordered 50 tank cars from the Pennsylvania Car Co.

The Roxana Petroleum Co., St. Louis, placed 200 8000-gal. and 201 10,000-gal. tank cars with the American Car & Foundry Co.

The Missouri Pacific placed 50 gondolas with the Pressed Steel Car Co.

The Santa Fe is inquiring for 23 passenger cars.

New York District Structural Work Showed Large Gain in 1925

Figures compiled by the Structural Steel Board of Trade, New York, show that a total of roundly 650,000 tons of structural steel work was contracted for by shops in the metropolitan district during 1925. The total in 1924 in the same district was 540,000 tons, while the 1923 figure was 450,000 tons.

Fabricated Steel Plate Gains

Bookings of fabricated steel plate showed gains in December over November and in 1925 over 1924, according to reports from 36 firms to the Department of Commerce. December totals were 31,395 tons, against 28,557 tons in November. The year's total was 325,649 tons, against 313,109 tons in 1924, both being far below the 1923 total of 539,043 tons.

Nearly half the December bookings—14,586 tons—went into stacks and miscellaneous, this item having been the heaviest for any month since April, 1923. Oil storage tanks accounted for 7714 tons; tank cars, for 3182 tons; gas holders, for 3172 tons; refinery materials and equipment, 2334 tons; blast furnaces, 407 tons.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

Copper, New York		Straits Tin (Spot)		Lead		Zinc	
Jan.	Lake	Electro-lytic*	New York	New York	St. Louis	New York	St. Louis
20.....	14.12½	13.87½	61.62½	9.25	9.00	8.67½	8.32½
21.....	14.12½	13.87½	61.87½	9.25	9.00	8.65	8.30
22.....	14.12½	13.75	62.37½	9.25	9.00	8.60	8.25
23.....	14.12½	13.75	.....	9.25	9.00	8.50	8.15
24.....	14.12½	13.75	61.62½	9.25	9.00	8.45	8.10
25.....	14.12½	13.75	61.50	9.25	9.00	8.40	8.05

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Jan. 26.

The markets are all either barely steady or weaker. Copper continues dull and hardly firm. The tin market is steady but not so active. There has been scarcely any change in lead but zinc has declined sharply.

Copper.—After fairly heavy buying in the middle of last week, with domestic consumers the leading purchasers and with prices as high as 14.12½c., delivered, for part of the time, the market has again turned weak and extremely dull with metal available at 14c. for shipment as far ahead as April. Yesterday and today the market has been exceedingly sluggish with very little inquiry either from domestic or foreign sources. Consumers have evidently covered their immediate needs at 14c. to 14.12½c., delivered, and see no reason for further purchases at present. Such business as is being done for export is reported at 13.95c. to 14c., f.a.s. Most of the domestic inquiries, noted in this market last week, resulted in orders a few days ago. Lake copper is quoted at 14.12½c., delivered, with demand very light.

Tin.—The week has been a quiet one with total sales about 650 tons, approximately half of this having been sold on Thursday, Jan. 21. Buying was about equally divided between dealers and consumers. The latter are evidently well covered for January and it is expected that they have little to buy for February, but their needs for March must evidently be largely provided for yet. There is less demand for prompt tin and most of the business lately has been for the more distant positions. An interesting development was a cable from London during the week to the effect that the decrease in the visible supply as of Feb. 1 will probably be about 1000 tons. The expected stimulation of the market, as the result of this announcement, did not materialize. There was a better tone on Thursday and Friday but yesterday and today it has not been so good; in fact, sentiment as a whole at the close of January is not as good as it was late in 1925. Yesterday and today the market has been stagnant with spot Straits tin quoted today at 61.50c., New York. Today's London quotations were a little lower than a week ago with spot standard quoted at £277 15s., future standard at £273 12s. 6d. and spot Straits at £279 5s. The Singapore quotation was £279 15s., or about £3 per ton less than a week ago. Arrivals thus far this month have been 4875 tons with 7070 tons reported afloat.

Lead.—Production and consumption are so evenly balanced that the market maintains an even tenor with scarcely any change in prices for some time. There has been an easing in supplies of prompt metal and quotations are a little lower for this position. Bookings for February consumption have been satisfactory but not in excess of production. The leading interest continues to quote 9.25c., New York, as its contract price. Quotations in the outside market are from 9c. to 9.10, St. Louis, or 9.25c. to 9.35c., New York.

Zinc.—The fact that stocks of zinc will probably show a substantial increase for January has had a decided effect on prices, which have been declining rapidly since the first of the month. Prompt metal, which was selling three weeks ago as high as 8.70c. to 8.75c., St. Louis, has declined nearly 75 points to

8.05c. to 8.10c., St. Louis, at the present time. The scarcity has disappeared and the premiums have diminished with March metal down to 8c., St. Louis. The New York quotation for prime Western zinc for February or early delivery is 8.40c. with March at 8.35c. There is very little domestic demand and practically no export business. The fact that export sales have been light in the past three months is the main cause of the expected increase in stocks.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Antimony.—The market continues to ease and Chinese metal for spot delivery is quoted at 21c., New York, duty paid, with future positions practically the same. With consumers fairly well covered speculators are inclined to take what profit they can, which explains the lower prices.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable in ingot form at 27c. per lb., delivered.

Old Metals.—The market is unsettled and business is dull. Dealers' selling prices, in cents per lb., are as follows:

Copper, heavy and crucible.....	13.50
Copper, heavy and wire.....	13.00
Copper, light and bottoms.....	11.75
Heavy machine composition.....	10.00
Brass, heavy.....	9.00
Brass, light.....	7.75
No. 1 red brass or composition turnings..	9.25
No. 1 yellow red brass turnings.....	9.25
Lead, heavy.....	8.50
Lead, tea.....	7.00
Zinc.....	5.75
Cast aluminum.....	21.50
Sheet aluminum.....	21.50

Chicago

JAN. 26.—Copper, antimony and zinc have declined in a market which is without feature and tin and lead are unchanged with buying only in moderate volume. Used metals are quiet and prices are unchanged. We quote, in carload lots: Lake copper, 14.15c.; tin, 63c.; lead, 9.15c.; zinc, 8.35c.; in less than carload lots, antimony, 24.50c. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.25c.; red brass, 9c.; yellow brass, 8c.; lead pipe, 8c.; zinc, 5.25c.; pewter, No. 1, 37c.; tin foil, 44c.; block tin, 52c.; all being dealers' buying prices for less than carload lots.

Non-Ferrous Rolled Products

No change has been made in the quotations on brass and copper rolled products since Dec. 16. Zinc and full lead sheets have not been changed in five weeks. For New York warehouse prices see page 260.

List Prices Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight Up to 75c. Per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets	
High brass.....	19¼c.
Copper, hot rolled.....	22½c.
Zinc.....	12c.
Lead (full sheets).....	13c.
Seamless Tubes	
High brass.....	23¾c.
Copper.....	24½c.
Rods	
High brass.....	16¾c.
Naval brass.....	19¾c.
Wire	
Copper.....	16¼c.
High brass.....	19¾c.
Copper in Rolls.....	21¾c.
Braced Brass Tubing.....	27½c.

Beehive Coke Output Higher

WASHINGTON, Jan. 25.—Production of beehive coke during the week ended Jan. 16 is estimated at 310,000 net tons, a gain of 20,000 tons, or about 7 per cent, over the revised figure for the preceding week, according to reports received by the Bureau of Mines from the principal carriers. Production during the first three weeks in 1926 has been at a slightly better rate than in 1925. The daily average during 1926 so far has been approximately 50,000 tons, as against 44,000 tons last year.

PERSONAL

William A. Rogers, who is now celebrating his seventy-fifth year, has just resigned from the last official position he has held in the iron and steel industry, he



WILLIAM A. ROGERS

has retired from practically every directorate of which he was a member and he will soon leave for a trip of several months in Italy and on the Mediterranean. He has been in the iron business over 50 years, for on graduating from Yale College as Ph.B., in 1874, he entered in December of that year the house of L. R. Hull & Co., pig iron merchants, beginning as clerk. Three years later he was admitted to the firm as junior partner. Later he formed the firm of Rogers & Trivett, which, through the death of Mr. Trivett soon after — and his place being filled by

Archer Brown—became Rogers, Brown & Co. In 1890 Mr. Rogers moved to Buffalo to take charge of the Buffalo branch of Rogers, Brown & Co., since which time he has occupied the position of president of the Tonawanda Iron & Steel Co., the Punxsutawney Iron Co., the Niagara Iron Mining Co., the Munro Iron Mining Co. and the Rogers-Brown Iron Co. He has been vice-president of the Iroquois Iron Co., Chicago, Cleveland Furnace Co., Buffalo Steamship Co., Cascade Coal & Coke Co., and a director of the Ontario Power Co., American Iron and Steel Institute, Marine Trust Co. and Erie County Savings Bank. He was born in Berkshire, N. Y., Sept. 8, 1851, but resided for the first 39 years at Cincinnati.

C. E. Trommer, sales representative Rogers Brown & Crocker Brothers, Inc., at Chicago, has been transferred to the New York office. Mr. Trommer has been identified with the Chicago and St. Louis offices of that company for several years.

G. L. Hulben has been added to the sales force of the Chicago branch of the Ludlum Steel Co., Watervliet, N. Y. For years Mr. Hulben has been connected with the Chicago sales division of a large tool steel manufacturer.

Eugene F. Hartley, formerly chief statistician, Division of Manufactures, Bureau of the Census, Department of Commerce, now is associated with the International Business Machines Corporation, 50 Broad Street, New York. L. B. Beals has been named as successor of Mr. Hartley as head of the Division of Manufactures.

E. A. Hagerman, who has been general manager of the Worth Steel Co., Claymont, Del., since August, 1923, was elected a director of the company at a meeting on Jan. 11. He started his apprenticeship in the steel business 23 years ago in the Worth mill at Coatesville, Pa., where he rose to the position of assistant general manager.

William H. McGregor has been elected chairman of the board, National Twist Drill & Tool Co., Detroit; Howard L. McGregor, president, and C. Earle Smith, vice-president and manager of sales.

S. Warren, for six years identified with the sales department of the Concrete Steel Co., New York, has become connected with the Tampa, Fla., office of Baker & Holmes, dealers in building materials, Jacksonville, Fla.

Russell Carter, formerly in charge of sheet sales for the Trumbull Steel Co., Warren, Ohio, is now engaged in the foundry business at Niles, Ohio.

H. H. Frey has been elected secretary-treasurer McKeesport Tin Plate Co., McKeesport, Pa. He fills the place made vacant by the death of W. L. Curry. Other officers of the company, E. R. Crawford, president, G. V. Parkins, vice-president, and H. E. Houser, assistant to secretary-treasurer, were re-elected.

Judge J. E. Cooper, vice-president and counsel of the Stanley Works, New Britain, Conn., and R. E. Pritchard, assistant treasurer, are on their way to Belgium to arrange for the opening of the company's new plant there.

Dr. G. B. Waterhouse, consulting engineer and metallurgist and professor of metallurgy at the Massachusetts Institute of Technology, Cambridge, Mass., expects to sail Jan. 30 on a professional trip which will take him to France, Belgium, Germany and England.

Joseph B. Graham has been elected vice-president in charge of manufacturing of Dodge Brothers, Inc., and A. Z. Mitchell, vice-president in charge of purchases. J. B. Graham is president of Graham Brothers, truck manufacturers, now a division of Dodge Brothers. His election to a vice-presidency follows the recent election of his brothers Robert C., as vice-president and general sales manager, and Ray A. Graham as general manager of Dodge Brothers.

H. L. Horning, president Waukesha Motor Co., Waukesha, Wis., has been elected president of the Motor and Accessory Manufacturers Association for 1926. Other officers elected were: first vice-president, C. H. L. Flintermann, Michigan Steel Casting Co., Detroit; second vice-president, E. B. Clark Clark Equipment Co., Buchanan, Mich.; third vice-president, M. A. Moynihan, Gemmer Mfg. Co., Detroit; treasurer, L. M. Wainwright, Diamond Chain & Mfg. Co., Indianapolis; secretary and assistant treasurer, J. M. McComb, Crucible Steel Co. of America, Pittsburgh.

James H. Enochs has been appointed manager of the new branch office opened at Indianapolis by the Harnischfeger Sales Corporation, Milwaukee. Mr. Enochs is a mechanical engineer, graduate of Purdue University, class of 1920. He entered the employ of the Harnischfeger Corporation as a shop apprentice and later was transferred to the sales force at Milwaukee.

J. F. Rice has been elected president and general manager, Drop Die & Engineering Co., Cleveland. Mr. Rice was formerly superintendent of the Steel Improvement & Forge Co., Cleveland.

E. D. Rogers has been elected president Morse Rogers Steel Co., Cleveland; J. D. Rogers, vice-president; Roscoe M. Ewing, secretary, and J. D. W. Snowden, treasurer.

A. F. Case has been appointed manager coal and ore division, Welman-Seaver-Morgan Co., Cleveland; P. H. Douglas, manager general equipment division; J. F. Rogers, manager gas producer division; J. B. Shaub, manager engineering production, in charge of entire drafting room and order department; J. H. Stratton and Miss J. L. Krotz, assistant purchasing agents.

H. L. Leonard has been elected president F. B. Stearns Co., Cleveland automobile builder, succeeding George H. Booker. Mr. Leonard was formerly vice-president and general manager Stephens Motor Car Co. Controlling interest in the Stearns company was acquired recently by the Willys-Overland Co., Toledo.

F. H. Chapin has resigned as vice-president in charge of operations of the Bourne-Fuller Co., Cleveland. His future plans have not been announced.

L. Kemper has been elected treasurer Otis Steel Co., Cleveland, to succeed George Bartol, who was elected a vice-president. Mr. Bartol retains his position as chairman of the executive committee. Mr. Kemper is vice-president Midland Steel Products Co., an affiliated interest.

Thorne L. Wheeler, formerly of Wheeler & Woodruff, chemical engineers, New York, has joined the organization of Arthur D. Little, Inc., chemists, engineers and managers, Cambridge, Mass.

Dr. A. W. Francis and Dr. Christian V. Holland have joined the staff of Arthur D. Little, Inc., chemists, engineers and managers, Cambridge, Mass. Dr. Francis was national research fellow in chemistry at the Massachusetts Institute of Technology, where he was engaged in work on directive influence in the benzene ring. Dr. Holland has been engaged in natural gas work.

John O. Tucker, who has been appointed general manager of sales, Wheeling Steel Corporation Wheeling, W. Va., has been identified with that organization since 1919 and with the steel industry since 1906. He succeeds Walter B. Higgins, who recently was elected to the board of directors and made vice-president in charge of sales. Mr. Tucker started with Joseph T. Ryerson & Son, Chicago, and was with that company for 13 years, serving first in its Kansas City district sales office and later in its St. Louis district office. He left that company in 1919 to become Detroit district sales manager of LaBelle Iron Works, Steubenville, Ohio, and continued in the same capacity for the Wheeling Steel Corporation, the combination of the LaBelle Iron Works, Wheeling Steel & Iron Co. and the Whitaker-Glessner Co. Mr. Tucker was promoted to assistant general manager of sales in the fall of 1925 and transferred to Wheeling.



JOHN O. TUCKER

Howard E. Boardman, president and treasurer Foster Merriam Co., Meriden, Conn., one of the oldest furniture caster firms in the country, and also operating a light gray iron foundry, has resigned, effective Jan. 16. Mr. Boardman has been in charge of the management of this business for over three years, during which the finances have been largely reorganized, considerable improvements made in manufacturing methods, and volume of business considerably expanded.

Charles C. Overmire has been placed in charge of iron, steel and cement sales in the East Bay district, for the American Finance & Commerce Co., exporter and importer, San Francisco, with offices at 305 Builders' Exchange, Oakland, Cal. Mr. Overmire was formerly in charge of the structural steel department of the Moore Dry Dock Co., Oakland, and previous to that was manager of the steel fabricating department of the Union Construction Co., San Francisco. From 1901 to 1920 he was manager of sales in the Pacific Northwest for the American Bridge Co. He is an alumnus of the engineering school, University of Minnesota.

R. W. Gillispie, for many years assistant general sales agent of the Bethlehem Steel Corporation, Bethlehem, Pa., has been transferred to the structural and plate department of the company as assistant general manager of sales of that division. Mr. Gillispie has been with the Bethlehem company since 1916, prior to that time having been connected with the Pennsylvania Steel Co., which was acquired by Bethlehem.

Frank T. Francis, who has been connected with the Part Drop Forge Co., Cleveland, for the past 4½ years, has resigned to become associated with the Cleveland representative of the Erie Forge & Steel Co., Erie, Pa., for the sale of steel castings. The sales office is at 974 Rockefeller Building.

H. S. Durant has been made manager, succeeding the late Lewis Johnson, of the cold rolled flat wire and spring department of the American Steel & Wire Co., 208 South La Salle Street, Chicago. Mr. Durant has held several positions with this company and during the World War was a colonel in charge of construction in the United States Army.

John Andrews, Jr., manager Cleveland branch office Westinghouse Electric & Mfg. Co., since 1922, has been transferred to the Detroit district office as manager, succeeding C. C. Owens, resigned. Mr. Andrews, a native of Pittsburgh, has been in the employ of the Westinghouse company since 1909. He served in various divisions of the Pittsburgh office until September, 1917, when he was made manager of the industrial division.

M. J. Miller has been appointed sales engineer in charge of the Detroit district for the Diamond Power Specialty Corporation, Detroit.

R. Charles Brower has been made assistant to H. J. Porter, vice-president in charge of sales Timken Roller Bearing Co., Canton, Ohio. Mr. Brower first became associated with the Timken company in 1916, as district manager of the Bearings Service Co., with offices in Detroit. At the dissolution of this company in 1922, the Timken Roller Bearing Service & Sales Co. was organized. He then came to Canton, the headquarters of the new company, as assistant general manager, which position he has held until his present promotion. The present offices will be maintained at Canton.

Charles E. Herring, commercial attaché at Berlin, has been transferred to Tokio, according to an announcement by Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce. Mr. Herring is now en route to Washington to discuss various problems relating to his new post before proceeding to the Far East.

J. E. Kreps, vice-president in charge of operations of the Union mills of the Bourne-Fuller Co., Cleveland, has been placed in charge of operations of both the Upson plant and the Union mills of that company, succeeding, at the Upson steel plant, F. H. Chapin, who recently resigned as vice-president in charge of operations.

George B. Doane, of Boston, has been elected chairman of the board of directors Perry, Buxton, Doane Co., Boston, succeeding W. Vernon Phillips of Philadelphia. A. L. D. Buxton was re-elected president; B. H. Lester, vice-president; F. R. Phillips, vice-president; George B. Doane, treasurer and W. H. Lane, secretary. The company, which deals in iron and steel scrap, maintains offices in Philadelphia, New York and Hartford; and yards at Modena, Pa., South Boston and Worcester, Mass., Portland, Me., and Providence, R. I.

To Discuss Industrial Plant Power Problems

Conservation of power in industrial plants will be discussed at conference to be held at the Engineers Club of Philadelphia, Feb. 16. There will be three sessions, presided over by Dr. A. M. Greene, Jr., dean of the mechanical engineering school of Princeton University; Dr. R. H. Fernald, director of the department of mechanical engineering of the University of Pennsylvania; and Maj. Clayton W. Pike, consulting electrical engineer and president of the Engineers Club of Philadelphia, respectively.

OBITUARY

John C. Greenway

JOHN C. GREENWAY, general manager of the Calumet & Arizona Mining Co., Warren, Ariz., died Jan. 19 in the Roosevelt Hospital, New York, after an operation. He was born July 6, 1872, at Huntsville, Ala. After attending the University of Virginia for two years he went to Yale, where he distinguished himself in football and baseball, received his bachelor of science degree in 1895, and was graduated as president of his class. He took up employment at the Duquesne, Pa., furnaces of the Carnegie Steel Co., starting as a helper and later becoming a foreman in the mechanical department. At the outbreak of the Spanish-American War, he joined Roosevelt's Rough Riders. At the close of the war he retired with the rank of captain. He then became assistant superintendent of the United States Steel Corporation's iron mines at Ishpeming, Mich., and in 1906 was transferred to the Mesabi district as general superintendent for the Oliver Iron Mining Co. It was during this period that he developed the turbolog washer that bears his name. In addition to his other early work, Mr. Greenway was called upon to construct roads, establish sewer systems and otherwise develop the town of Coleraine.



JOHN C. GREENWAY

In 1910 he left the Mesabi to become general manager of the Calumet & Arizona Mining Co., and in 1911 developed the New Cornelia Copper Mine at Ajo, and large-scale plans for the first leaching-electrolytic plant for copper ores. The economic and metallurgical success of this operation is regarded as outstanding in the history of mining enterprises and as marking a distinct step forward in the treatment of low-grade ores.

At the outbreak of the World War, Mr. Greenway accepted a commission as a major of the engineers and later at his request was transferred to the infantry. He was in action on several fronts and was awarded the Distinguished Service Cross, the Croix de Guerre with two palms, the Croix de L'Etoile Noire and the French Legion of Honor. He was a member, among others, of the American Institute of Mining and Metallurgical Engineers and the Yale Engineering Society.

JAMES W. MCCLURE, a member of the firm of G. W. McClure, Son & Co., engineers and contractors and builders of blast furnaces, died at his home in Pittsburgh, Jan. 17. He was born in Pittsburgh in January, 1862, a son of George W. McClure, the founder of the firm and a pioneer in the blast furnace business. The early history of the firm dates back some 70 years when G. W. McClure entered into the building of blast furnaces. His first operation was with Lyons & Schaub, on the Alleghany Mountains. This firm at that time operated the "Sligo" plant at Pittsburgh. In the early days a furnace of 10 to 20 tons daily capacity was considered large. In 1885 James W. McClure became associated with his father and in 1893 was taken into partnership, when the firm became G. W. McClure & Son, continuing making a specialty of building blast furnaces and the McClure hot blast stoves and bringing into use a number of improvements in blast furnace construction. In 1899 Joseph B. Pearson, associated as engineer with the firm for many years, became a

partner and the firm thereafter was known as G. W. McClure, Son & Co. The firm installed furnaces and hot blast stoves throughout this country as well as in Mexico, Japan and South America. Upon the death of G. W. McClure in 1912 James W. McClure and Joseph B. Pearson continued under the same firm name.

GEORGE HAISS, president George Haiss Mfg. Co., Park Avenue at 141st Street, New York, died of apoplexy on Jan. 11. He was born at Bethel, N. Y., April 22, 1859. In 1892 Mr. Haiss organized the George Haiss Mfg. Co., manufacturer of material-handling machinery. Among his better known inventions and patents are: Clam shell buckets, coal hoisting towers, continuous elevators and bucket conveyors, belt conveyors and truck loaders. He was also president of the Haiss Realty Co., New York. He is survived by Mrs. Haiss, three sons and daughter.

CHARLES H. BAKER, who for 14 years was in the employ of the Adriance Machine Works, Inc., Brooklyn, as special sales representative and later as sales manager of the sheet metal working department, died Jan. 14 at the Irvington, N. J., Hospital from heart failure, following a minor operation. Mr. Baker entered the employ of the Detroit Electric Works in 1890 and went from there to the Walker Electric Co., Cleveland. In 1900 he became erecting engineer with the General Electric Co., remaining there seven years and resigning to accept a similar position with the Crocker-Wheeler Co. The late Col. Benjamin Adriance induced him to accept the position with the Adriance company. Mr. Baker was 66 years old. He was married in 1890 to Matilda Graham, Mitchell, Ont., who survives him.

WILLIAM B. TROUT, president H. G. Trout Iron Works, Buffalo, died Jan. 7 after an illness of about two months. He was 76 years of age and had been associated with the Trout works, manufacturer of marine equipment, for some 50 years.

WILLIAM ROTHEN, one of the best known machine tool salesmen of the New York metropolitan district, who had represented Henry Prentiss & Co., New York, for many years in northern New Jersey, died Jan. 13, at the Orange Memorial Hospital, Orange, N. J. He entered the employ of Henry Prentiss & Co. in 1903 and, after serving an apprenticeship in the office, was promoted to the job of selling. Mr. Rothen resided at 480 Richmond Avenue, South Orange.

WILLIAM WARREN BIRD, president Broadway Iron Foundry Co., Cambridge, Mass., a business instituted by his father, died suddenly, Sunday, Jan. 24, at his home in Worcester, Mass. He was born in Somerville, Mass., April 11, 1866, and was graduated from the Worcester Polytechnic Institute in 1887, where, later in life, he was for many years head of the mechanical engineering department. Two years ago he resigned from the institute staff, but was retained as a lecturer. Mr. Bird was affiliated with the American Society of Mechanical Engineers and the New England Foundrymen's Association. Among several papers contributed by Professor Bird to the proceedings of the former Society were those on belt creep, on a twist drill dynamometer and on foundry cost accounting systems.

The late Charles W. Lummis, Worcester, Mass., mechanical engineer in the gas producer department of the Morgan Construction Co., left the bulk of his estate in trust for his wife and sisters. The will provided that upon their deaths the principal is to go to Princeton University. It is stipulated that the university shall permit the fund, the amount of which is not given, to accumulate until it reaches \$200,000, the income then to be devoted to scholarships for deserving students.

Trade Changes

Effective Jan. 1, the prime mover sales activities of the Westinghouse Electric & Mfg. Co. will be conducted by a new sales organization to be located at the South Philadelphia Works. The personnel of this new department will include: Howell Van Blarcom, formerly assistant to the manager power department, South Philadelphia Works, manager; R. E. Carothers, formerly manager of the steam division power department, East Pittsburgh plant, assistant manager; A. H. Ganshird, formerly of the large turbine section East Pittsburgh plant, to manager of the larger turbine section; C. G. Ong, formerly of the central station division, Boston office, manager of small turbine section and P. L. Fetzner, formerly of the condenser section, East Pittsburgh, manager of condenser section.

Carroll-McCreary Co., Inc., iron and steel jobber, has removed to its new warehouse at 21-51 Borden Avenue, Long Island City, N. Y.

John T. Rowntree, Inc., has moved its offices from the Higgins Building, Los Angeles, to room 407, Chamber of Commerce Building, Broadway and Twelfth Street, Los Angeles.

The Aetna Steel & Iron Co., Inc., Southington, Conn., states that its name has not been changed to the Standard Steel & Iron Co., as has been reported.

Debevoise-Anderson Co., Inc., 114 Liberty Street, New York, has been appointed sales agent in the United States and Canada for Sota & Aznar, Bilbao, Spain, and London, England, in the sale of their high-grade ores. This arrangement became effective on Jan. 1.

The Mid-Western Steel Corporation, manufacturer of steel bands, bars and hoops, 5 East Garfield Boulevard, Chicago, has taken over the plant and equipment of the Riverdale Rolling Mill, Riverdale, Ill., and will operate the plant entirely on steel.

An interest in the Laundryette Mfg. Co., Cleveland, manufacturer of wringerless washing machines, has been purchased by C. S. Gennison, formerly a partner in the George W. Goethals Co., New York, and Paul K. Craig, who has been engaged in the merchandising of electrical appliances in Philadelphia. Mr. Gennison will become president of the company and Mr. Craig will be a vice-president and secretary. A. G. Cook has been reelected treasurer.

The Millcreek Coal & Coke Co., Coopers, W. Va., producer of Pocahontas foundry coke, has appointed Hickman, Williams & Co., exclusive selling agents, effective Jan. 1.

The V. E. Montgomery Co., Cincinnati, dealers in pig iron, coke and alloys, has moved its offices from the Carew Building to 408 First National Bank Building. The change was necessitated by expansion of the company's business. Vaughan E. Montgomery, formerly district sales manager in Cincinnati for Crocker Brothers, is president.

The Bates Expanded Steel Truss Co. moved its executive offices, Jan. 15, from the Illinois Merchants Bank Building, Chicago, to the new office building at the company's plant at East Chicago, Ind.

Henry L. Scott & Co., 101 Blackstone Street, Providence, have changed from a partnership to a corporation, with capital stock of \$150,000, and a change of name to the Henry L. Scott Co. It manufactures testing apparatus. There will be no changes in management or personnel.

Commencing Jan. 21 the name of the R. A. Hart Mfg. Co., Battle Creek, Mich., is changed to R. E. Hart Mfg. Co., of the same address.

The Steel Sales Corporation, 129 South Jefferson Street, Chicago, has purchased the Chicago stock of the Union Drawn Steel Co., which has discontinued operation of its Chicago warehouse. In the future, quantity stocks of all commercial sizes of screw stock, shafting, rounds, shapes, S.A.E. 1020, S.A.E. 2320, cone steel and 0.40 to 0.50 per cent carbon steel are to be maintained in Chicago for immediate shipment.

The Hayward Mfg. Co., 780 Union Street, Brooklyn, contract manufacturer of screw machine parts and bronze castings, has been changed from a partnership to a corporation, with capital stock of \$50,000. The company has been in business as a partnership for two and a half years and no changes are contemplated in the character of the business as it has been conducted.

The Kokomo Stamped Metal Co., Kokomo, Ind., has purchased a half interest in the Junior Wheel Goods Co., Los Angeles, Cal., manufacturer of juvenile vehicles, and the name of the latter company has been changed to the Junior Wheel Goods Corporation. The business will be moved to Kokomo. The remaining half interest in the Junior Wheel Goods Corporation is owned by the E. M. Smith Co., Los

Angeles, manufacturer of automobile supplies and accessories.

The L. C. Smith & Corona Typewriters, Inc., a consolidation of the L. C. Smith & Brothers Typewriter Co., Syracuse, N. Y., and the Corona Typewriter Co., Groton, N. Y., has elected the following officers: Wilbert L. Smith, chairman of the board; Frank R. Ford, president; Francis E. Van Buskirk, vice-president and secretary; Carlton S. Brown, vice-president; Lawrence J. Conger, vice-president; B. C. Milner, Jr., assistant to president; and William H. Haun, treasurer.

Control of the Columbus McKinnon Chain Co., Columbus, Ohio, has passed into the hands of Julius F. Stone, for a number of years vice-president of the company. Mr. Stone will become president, succeeding C. M. Wambaugh, who has been president since 1917, and who was president of the Columbus Chain Co., a predecessor, since 1901. The company has branches in Lebanon, Pa., Tonawanda, N. Y., and St. Catherine, Ontario. It makes welded chain for automobile and other use.

The Earle Gear & Machine Co., 4707-4715 Stenton Avenue, Philadelphia, has sold patents and good will covering the manufacture of Earle centrifugal pumps to the Aldrich Pump Co., 1 Pine Street, Allentown, Pa., and the latter company will continue the manufacture and marketing of these pumps. The Earle Gear & Machine Co. will continue the manufacture of cut gears, movable bridge operating machinery, cold metal saws and special machinery.

Owing to the recent death of Herbert Austin, senior partner, the firm of Austin & Doten, 102 North Street, Boston, on Dec. 31 expired by limitation. The Austin-Hastings Co. hereafter will deal in Shelby steel tubing; National boiler tubes; Superior strip steel; Union drawn shafting and screw stock. Harry L. Doten & Sons will deal in sheet iron, angles, tees, rivets, tinplates, sheet copper, brass pipes, etc. For the present the office of both concerns will continue at 102 North Street.

The Harnischfeger Sales Corporation, builder of cranes and excavators, announces the removal of its Birmingham office from 431 First National Bank Building to 401 Pioneer Building. J. Van Buskirk is district manager.

The San Francisco office of the Republic Iron & Steel Co. has been moved from room 317 to room 731, Rialto Building.

The Perfection Stove Co., Cleveland, has selected Atlanta as its district headquarters for the Southeast, according to Fred Newell, secretary of the Industrial Bureau of the Atlanta Chamber of Commerce. Offices and warehouse facilities have been secured at 8 Courtland Street.

Abrasive Sales Conference

During the week of Jan. 4 the Abrasive Co. held its annual sales conference at the Philadelphia plant. The sessions were presided over by Edward W. Dodge, sales manager. Plans for the current year were reviewed and approved by the sales representatives present. The officials of the company entertained the visiting field men at dinner at the Manufacturers' Club on the evening of Jan. 6. Among the representatives present were:

M. R. Clark and C. B. Yeomans, Cleveland; B. S. Coop, Atlanta; A. B. Davenport, Jr., Pittsburgh; F. G. Dowling, San Francisco; Dwight W. Grover, New York; J. G. Herold, Dayton; W. A. MacFarland, A. T. Hughes, W. A. McMillan, A. J. Lewis, Detroit; L. R. Kerns, Grand Rapids; P. R. Ketzner, L. J. Musser, R. E. Stagmer, E. M. Wilkinson, W. W. Wilson, Philadelphia; A. M. Leverich, Milwaukee; Edward J. Kelly, Adrian, Mich.; J. Carl Snyder, Buffalo; T. B. Woodrow, Indianapolis; R. H. White, Hamilton, Ontario.

The Norton Co., Worcester, Mass., abrasives and grinding machinery, announced a stock dividend of \$5,000,000 common stock payable to common share holders of record Dec. 15. With the dividend payment, the company's capitalization will be \$13,982,000, or 139,820 shares of \$100 par value. The company has retired and cancelled \$6,000,000 preferred stock, of which \$3,054,100 was outstanding and the balance in the treasury and sinking fund. By this financing the company's total capitalization is therefore reduced, in round numbers, \$1,000,000. As of Nov. 30, last, the company showed current assets of \$5,342,488, and current liabilities of \$436,521. Cash on hand as of that date totaled \$3,081,953, and the company had an additional \$375,533 in Government bonds. At the same time there were no bank loans outstanding and no funded debt, while the surplus account stood at \$6,225,646.

Machinery Markets and News of the Works

RAILROADS INQUIRING

Machine Tool Requirements of Several Roads Now Being Figured On

Business Shows Some Improvement Over First Half of January and Prospects Are Considered Excellent

INQUIRY for machine tools from several railroads gives the market an appearance of greater activity than it has had since before the holidays. The Chicago & North Western has issued a list of 27 tools; the Delaware & Hudson is inquiring for five tools; the New York Central has bought three axle lathes and is inquiring for three radial drilling machines and other tools. There are also smaller inquiries from other roads.

Automobile manufacturers are placing very few or-

ders for tools, a condition not unusual for this time of year when the automobile shows are in progress. However, parts manufacturers are receiving contracts from some automobile manufacturers that indicate a manufacturing program approximating that of the first quarter of 1925 and some of these parts makers in the Detroit territory are figuring on additional shop equipment.

Purchases of tools by manufacturers in the general industrial field are more numerous than in the first half of January, but in some districts there is disappointment that the volume of buying this month has not attained the December rate. The Gardner-Morgan Electric Co., Chicago, has made purchases against a list recently issued. Other buyers of small lots of machines are the International Cement Co., New York, for a New Orleans plant; the Pullman Car & Mfg. Corporation, Pullman, Ill.; Delco Light Co., Dayton, Ohio, and the United Engineering & Foundry Co., Pittsburgh.

New York

NEW YORK, Jan. 26.

MACHINE-TOOL business has shown quite an improvement over the first half of the month. Inquiries are more numerous and the trade regards buying prospects as very hopeful. The New York Central Railroad has bought three axle lathes and is inquiring for a number of other tools and the Delaware & Hudson is in the market for five machines. The Baltimore & Ohio has bought a car wheel lathe. The International Cement Co. bought a small list of tools for its works at New Orleans. The General Electric Co., Schenectady, N. Y., has been buying tools for the manufacture of electric refrigeration equipment, a line in which this company is engaging quite extensively. Other tool purchases include the following: Ingersoll-Rand Co., New York, 27-in. x 14-ft. engine lathe; an elevator manufacturing company, three thread milling machines; Colburn Trolley Track Co., Holyoke, Mass., a 14-in. geared-head lathe; E. J. Berg Mfg. Co., Gardner, Mass., a 14-in. vertical surface grinder; Rotary Disc Bit Co., Los Angeles, a 16-in. geared-head lathe.

Contract has been let by the American Can Co., 120 Broadway, New York, to the Lindgren & Swinerton Co., 225 Bush Street, San Francisco, for its proposed one-story plant at Sacramento, Cal., reported to cost \$500,000 with machinery. San Francisco offices are at Third Avenue and Twenty-second Street.

The L. & W. Garage Corporation, 25 Delancey Street, New York, has awarded a general contract to H. Rosen, 275 West Twelfth Street, for a three-story and basement service, repair and garage building, 76 x 100 ft., at 224-28 Mulberry Street, to cost \$170,000 with equipment. Murray Klein, 37 Graham Avenue, Brooklyn, is architect. Samuel Witkin is president.

Charles F. Avery, 76 Cortlandt Street, New York, railroad equipment and supplies, is in the market for a marine type boiler, about 250-hp. capacity.

The Tannin Corporation, 100 East Forty-second Street, New York, manufacturer of tanning extracts, etc., is said to be planning the erection of a new four-unit plant on waterfront site to cost close to \$450,000 with machinery. Emmett B. Carter is company engineer.

Plans are being arranged for a merger of the Rockland Light & Power Co., Nyack, N. Y., Catskill Power Corporation and Orange County Public Service Co., Middletown,

N. Y., under the first noted name, with capital of about \$10,000,000. The consolidated company purposes to construct a hydroelectric generating plant on the Mongaup River, with transmission lines to the Rockland and Orange County districts. Millard F. Clement is general manager of the Orange County company.

The Chevrolet Motor Co., Broadway and Fifty-seventh Street, New York, has filed plans for a two-story service and repair building, 100 x 200 ft., at 544-50 West Fifty-sixth Street, to cost \$185,000.

The E. W. Bliss Co., Fifty-third Street and Second Avenue, Brooklyn, manufacturer of presses and other heavy machinery, has arranged for an increase in capital of \$600,000, a considerable portion of the proceeds to be used for a 1926 expansion program. The company will be reorganized and a charter taken out under Delaware laws, replacing an existing West Virginia corporation.

Randell Henderson, Depot Square, White Plains, N. Y., architect, has plans for a two-story service, repair and garage building, 100 x 100 ft., at Tuckahoe, N. Y., to cost about \$50,000.

The Manhattan Electrical Supply Co., 17 Park Place, New York, has acquired a controlling interest in the Trout Mining Co., and the Halliwell Electric Co., 115 Fourth Avenue, and will use the plants of these organizations for expansion in manufacture. The company has work under way on an addition to its plant at Jersey City, N. J., and expects to have the structure ready for service at an early date. Charles T. Baisley is president.

The Standard Gas Equipment Corporation, 22 East Forty-first Street, New York, comprising a recent merger of the Baltimore Gas. Appliance & Mfg. Co., Baltimore, and the William M. Crane Co., New York, is disposing of a preferred stock issue of \$1,250,000, a portion of the fund to be used for the purchase of the plant and business of Rathbone, Sard & Co., Aurora, Ill., manufacturer of gas ranges and appliances, and for proposed expansion in plants and facilities. R. Curzon Hoffman, Jr., is president.

George W. Swiller, 543 Claremont Parkway, New York, architect, has filed plans for a two-story automobile service, repair and garage building, 100 x 118 ft., at Sedgwick Avenue and 167th Street, to cost \$85,000 including equipment.

The council of the Borough of Queens, Borough Hall, Long Island City, M. E. Connolly, president, has plans for a one-story sand-screening plant, with crushing and grit building, 60 x 61 ft. and 50 x 55 ft., respectively, for municipal service, estimated to cost \$55,000 with equipment.

Philip Stein, 1098 Grand Avenue, Brooklyn, manufacturer of commercial automobile bodies, has awarded a general contract to A. Wexler, 637 Metropolitan Avenue, for a one-

story addition, 30 x 75 ft., to be equipped as a forge and blacksmith shop. Levy & Berger, 375 Fulton Street, are architects.

The Bush Terminal Co., 100 Broad Street, New York, will soon begin the construction of two additional multi-story units at its industrial terminal at South Brooklyn, to occupy the blocks on First Avenue, between Thirty-ninth and Forty-first Street, estimated to cost \$2,000,000. The company is also understood to be planning for the early erection of two more units. William Higginson, 15 Park Row, New York, is architect and engineer.

F. A. D. Andrea, Inc., 1581 Jerome Avenue, New York, manufacturer of radio equipment, has acquired a block of property, 150 x 225 ft., on 138th Street, between Mott and Walton Avenues, as a site for a new four-story plant, to cost \$750,000 with machinery. It is proposed to remove the present business to the new location. The Ballinger Co., 100 East Forty-second Street, is architect and engineer.

The Dover Boiler Works, Inc., Dover, N. J., has been formed under State laws with capital of \$500,000, to take over and expand the company of the same name. It is proposed to provide increased facilities at the local plant for boiler and other steel plate products. The new company is headed by William F. and William D. Birch, and Floyd M. Diehl.

The Federal Furniture Factories, Inc., New York, recently formed with a capitalization of \$15,000,000, will take over and consolidate the Federal Furniture Factories, 816 Clinton Street, Hoboken, N. J., manufacturer of metal beds, etc.; the Irving Furniture Factories, Inc., 469 Seventh Avenue, New York; and the Carolina Wood Products Co., Asheville, N. C. Plans are under way for expansion, including an extension in the Asheville works to double the present capacity. Assembling plants will be operated in Pittsburgh, Cleveland, Detroit, Chicago, Boston, Philadelphia, Newark, N. J., and other cities. Irving Isaacs is president.

The Board of Education, Ridgewood, N. J., is said to be planning the installation of manual training equipment in a proposed three-story and basement addition to the high school, to cost \$200,000. Egerton Swartwout, 18 West Thirty-fourth Street, New York, is architect.

The Lightoller Co., 569 Broadway, New York, manufacturer of electric lighting fixtures and equipment, has purchased the eight-story and basement plant at Claremont and West Side Avenues and Halstead Street, Jersey City, N. J., totaling 238,700 sq. ft., of floor space. The property is now occupied under lease by the Western Electric Co., pending the completion of its new plant at Kearny, N. J., and the new owner will take possession in the near future. Manufacturing operations will be concentrated at this location.

The Vimalert Co., Ltd., organized to manufacture marine and airplane engines, has acquired the plant of the James Craig Engine Works, 807-41 Garfield Avenue, Jersey City, N. J., consisting of a main works, 80 x 168 ft., and adjoining structure, 45 x 145 ft., and will establish a new plant at this location. Possession will be taken at once.

The Goodyear Tire & Rubber Co., 120 Broadway, New York, with main plant at Akron, Ohio, has acquired the mill of the Essex Cotton Mills, Brighton Avenue, Passaic, N. J., for a new branch plant.

The Town Council, Kearny, N. J., plans the construction of a pumping plant in connection with extensions in the water system in the Belleville Turnpike and Kearny Avenue sections. The entire project will cost approximately \$600,000.

The W. L. Walker Co., Millville, N. J., will establish a local plant in the building formerly occupied by the Kimp-ton-Haupt Co., installing equipment for the manufacture of a patented glass jar. Employment will be given to about 70.

The Furnace Engineering Co., Inc., 5 Beekman Street, New York, has been incorporated in Delaware as a holding company of the Furnace Engineering Co., a New York corporation. The latter company was incorporated in 1919 and has been engaged in the manufacturing of pulverizers, patented grates and furnace specialties. The pulverizing equipment is manufactured for this company on contract by the Weatherly Foundry & Mfg. Co., Weatherly, Pa.

The Jaeger-Carlson Mfg. Co., 161-167 Jamaica Avenue, Brooklyn, has been incorporated and has taken over the plant, assets and liabilities of the Bel-Tone Radio Co., which includes a factory completely equipped for the manufacture of all kinds of electrical coils, such as ignition coils, control coils, magnets, etc., besides many items for the radio industry.

Winter & Co., 61 Arlington Street, Newark, N. J., have been organized to manufacture jewelry novelties and have succeeded to the business formerly conducted by the Andrew O. Kiefer Co., same address.

The Brunnquell Iron Works, Inc., has succeeded to the business of the George J. Brunnquell Iron Works, 122 Monroe

Street, Hoboken, N. J. This company is engaged in the fabricating of structural steel, ornamental iron work, and plate work of a miscellaneous character. Officers of the Brunnquell Iron Works, Inc., are George J. Brunnquell, president, and Frederick H. Holtermann, secretary and treasurer.

The Ramapo Ajax Corporation, 30 Church Street, New York, has issued a denial of the recently published statement that it has concluded negotiations for the purchase of the buildings and machinery formerly the plant of the Pardee Steel Corporation, Perth Amboy, N. J.

The Ludlum Steel Co., Watervliet, N. Y., has doubled the capacity of its billet grinding department, now ready for occupancy. The department will be equipped with a modern exhaust system for the elimination of the dust incidental to all grinding operations.

The Pfeiffer-Wadellon Co., 114 Liberty Street, New York, scrap dealer, has been formed by Charles Pfeiffer and Henry B. Wadellon, with R. Steinemann, G. H. Wilde and L. Gates as associates, all formerly with the Debevoise-Anderson Company, Inc., New York.

New England

BOSTON, Jan. 25.

THE local machine-tool market continues fairly active and dealers in other New England cities report increasing sales. Most of the individual purchases involve one or two machines, however, and include a 14-in. vertical surface grinder, a \$600 bench milling machine, a small used tool room lathe, a used upright drill and two used two-spindle drills, all for Massachusetts shops. In addition, a used pipe machine and a used upright drill were sold the past week for shipment to California, a used 36-in. planer to a Detroit shop, and dealers in New York and New Jersey also bought considerable used machinery. A new Malden, Mass., shop purchased three machines, a 16-in. shaper and two 14-in. tool room lathes, bringing its total purchases of used equipment to 15. Inquiries are more numerous and include several machines costing from \$1,800 to \$2,500 each, with some running as high as \$5,000 to \$9,000.

A sizable amount of school business is in the process of development. Local dealers state this is a sellers' market for the first time in several years, with deliveries extended and possibilities of higher rather than lower prices. January gives indication of being the best month experienced by local machine-tool houses in a long time, and the general opinion is that February sales will run well in excess of those for this month.

The Wyman Gordon Co., Bradley Street, Worcester, Mass., is installing a 58-ton base for a large trip-hammer in its foundry.

The Wellmade Electric Mfg. Co., Torrington, Conn., has been incorporated to manufacture electrical appliances and small hardware specialties. At present its output consists of two-piece attachment plugs, electric soldering irons, cord sets and other electrical devices. The company is planning to add to this line extensively during the year.

New equipment will be required by W. W. Crocker, 322 Main Street, Cambridge, Mass., metal worker, whose shop was burned last week.

The Riverside Boiler Works, 491 Main Street, Cambridge, is making extensive alterations. Herbert S. Kimball, 177 State Street, Boston, is the engineer.

The Russell & Erwin division American Hardware Corporation, New Britain, Conn., will build a two-story manufacturing unit having 43,200 sq. ft. of floor space, to cost without equipment \$125,000.

The Simplex Wire & Cable Co., Cambridge, has acquired 20,139 sq. ft. of adjoining land, a three-story brick plant and a one-story frame building for additional manufacturing purposes.

Plans are in progress for a one and two-story work shop and repair garage contemplated by Patrick M. Power, 35 Prescott Street, Worcester, Mass. Harry L. Meacham, 571 Main Street, is the architect.

Fire, Jan. 16, destroyed a portion of the plant of the Hamblin & Russell Mfg. Co., Water Street, Worcester, Mass., manufacturer of wire goods, hardware products, etc., with loss reported at \$25,000. It is planned to rebuild.

C. I. Brink, Inc., 24 Gold Street, Boston, manufacturer of electric signs and displays, flashing devices, etc., is con-

The Crane Market

THERE is still but little current inquiry for either locomotive or overhead traveling cranes, but some activity has been provided by the closing of small lists of overhead equipment and occasional requests for estimates on the cost of locomotive cranes by the railroads. Among current inquiries is the request for prices on a 5-ton 18-ft. span hand power crane from the Phoenix Utility Co., 71 Broadway, New York. In addition this company is still in the market for a 60-ton and 35-ton electric crane and a 10-ton hand power crane. The Hiler Engineering Co., Brooklyn, N. Y., recently reported to have closed on two bucket handling cranes for Buffalo, N. Y., has not yet purchased.

In the Pittsburgh district it is expected that several more cranes will be required by the Carnegie Steel Co. for its Mingo plant and a number of cranes for the Homestead works will probably be placed soon. Formal inquiry has been made by the Weirton Steel Co. for a number of cranes and for a charging machine in connection with its open-hearth plant extension.

Among recent purchases are:

Reading Railroad, Philadelphia, four 25-ton and two 50-ton electric overhead cranes from the Niles-Bement-Pond Co.

Lockwood, Greene & Co., engineers, New York, six 5-ton electric cranes from the Bacon Co., Brooklyn, N. Y., eight 1-ton electric hoists from the American Engineering Co. and a section of overhead rail from the Loudon Machinery Co., all for a rayon plant at Johnson City, Tenn.

Buffalo General Electric Co., Buffalo, N. Y., a 100-ton electric overhead crane for Buffalo, from the Whiting Corporation.

Thomas E. Murray, consulting engineer, New York, a

10-ton, 60-ft. span, 3-motor overhead crane for the East River station of the New York Edison Co., from the Shaw Electric Crane Co.

Providence Water Supply Co., Hope, R. I., a 5-ton hand power crane for a purification plant at Scituate, Mass., from the New Jersey Foundry & Machine Co.

United States Engineers Office, Porto Rico, a 3-ton, 23-ft. span hand power crane from the New Jersey Foundry & Machine Co.

Foundation Co., 120 Liberty Street, New York, a 40-ton locomotive crane reported purchased from the Industrial Works.

Stacey Brothers Construction Co., Cincinnati, a 30-ton locomotive crane from the McMyler-Interstate Co.

Jessup & Moore Paper Co., Wilmington, Del., a 17½-ton electric overhead crane from the Whiting Corporation.

Evansville Sand & Gravel Co., Chicago, recently in the market for a 20-ton locomotive crane is reported to have purchased a used machine locally.

Carnegie Steel Co., Pittsburgh, an 80-ton crane with 25-ton auxiliary, a 20-ton overhead crane and a 10-ton wall crane, from the Alliance Machine Co.

West Leechburg Steel Co., Leechburg, Pa., a 10-ton, 60-ft. span crane from the Northern Engineering Works.

Concrete Products Co., Pittsburgh, a 3-ton, 40-ft. span overhead crane for its Pottstown, Pa., plant, from the Northern Engineering Works.

Western Electric Co., Chicago, a 1-ton, 46-ft. 8-in. span, 2-motor overhead crane through Page & Ludwick, Chicago, from the Milwaukee Electric Crane & Mfg. Co.

considering the erection of a one and two-story addition to cost \$15,000.

The Progressive Mfg. Co., Torrington, Conn., manufacturer of machine bolts, studs, etc., has plans for a one-story addition, 60 x 140 ft. William E. Hunt, Torrington, is architect.

Fire, Jan. 19, destroyed a building at the plant of Bird & Son, Inc., East Walpole, Mass., manufacturer of roofing products, with loss estimated at \$25,000. It is planned to rebuild.

George N. Meserve, 200 Devonshire Street, Boston, architect, has plans for an eight-story automobile service, repair and garage building at Columbus Avenue, Dartmouth and Buckingham Streets, to cost \$200,000 with equipment.

Fire, Jan. 19, destroyed a portion of two units of the refining plant of the Beacon Oil Co., Everett, Mass., with loss reported at \$100,000 including equipment. Plans for rebuilding are under consideration.

The Town Council, Hamden, Conn., has taken out a permit for the erection of a one-story pumping plant for the municipal waterworks. Buck & Sheldon, Hartford, Conn., are architects and engineers.

The Derby Gas & Electric Co., Derby, Conn., has awarded a general contract to the Smith & Son Co., 76 Minerva Street, for its proposed three-story and basement repair and equipment shop, 40 x 83 ft., to cost \$50,000. R. W. Foote, 185 Church Street, New Haven, Conn., is architect.

Fire, Jan. 16, destroyed a portion of the power house of the Rockville-Willimantic Lighting Co., Rockville, Conn., with loss estimated at \$35,000 including equipment. It is planned to rebuild.

The Phoenix Industrial Chemical Co., 388 East Eighth Street, South Boston, is said to be contemplating the erection of a new plant to cost close to \$50,000 with equipment.

The New England Power Association, Worcester, Mass., has been organized to take over and expand the New England Co. and its affiliated electric utility interests. The new organization has arranged for an increase in capital of about \$20,000,000, the majority of the fund to be used for the purchase of additional properties and for extensions and improvements in existing power plants and system.

The Nash Engineering Co., South Norwalk, Conn., manufacturer of compressors, pumps, etc., has filed plans for a one-story addition, 50 x 170 ft.

The New Bedford Steel & Supply Co., New Bedford, Mass., has formally opened its new plant with a complete stock of structural steel, steel bars, plates, sheets, tubes, pipe, pipe fittings and supplies. The plant is three and four stories, 85 x 250 ft., and is well equipped for handling materials. Clark W. Holcomb is president; John W. Lancaster, vice-president and general manager, and Allie W. Omev, treasurer.

Philadelphia

PHILADELPHIA, Jan. 25.

PLANS are being prepared by Swift & Co., Union Stock Yards, Chicago, for rebuilding the portion of their plant, including cold storage and refrigerating department, at Ninth and Girard Streets, Philadelphia, recently destroyed by fire. The buildings will be one and four stories, and will include an automobile service, repair and garage structure for company cars, estimated to cost \$200,000. F. M. Hall is district manager.

The Sun Oil Co., 1428 South Penn Square, Philadelphia, is considering the construction of two new storage and distributing plants at Oklahoma City, Okla., and Kansas City, Mo., respectively, to cost about \$200,000 each with equipment.

The Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies, has taken title to about 5 acres on Stokley Street, fronting on the line of the Philadelphia & Reading, for \$150,000, and is reported to be planning to use the site for expansion. The property was formerly used in part by the Vim Motor Co.

The Board of Education, Philadelphia, is said to be planning for the installation of manual training equipment in the proposed junior high school to be erected at Twenty-sixth and Cumberland Streets, reported to cost \$800,000, for which bids are being asked on a general contract until Feb. 2. Irwin T. Catherine is architect for the board.

Fire, Jan. 16, destroyed a portion of the three-story factory of S. Cohen & Sons, Second and Queen Streets, Philadelphia, manufacturer of toys, with loss reported at \$14,000. It is planned to rebuild.

The Board of Education, Manheim, Pa., is considering the installation of manual training equipment in its proposed two-story and basement high school, reported to cost \$175,000, for which bids have been asked on a general contract. Henry Y. Staub, 20 North Queen Street, Lancaster, Pa., is architect. J. B. Kendig is president.

The Giant Portland Cement Co., Coplay, Pa., is making alterations and improvements in its Reliance mill, to include machinery replacements and repairs and the installation of additional equipment.

The Fisher Body Co., Detroit, manufacturer of automobile bodies, has awarded a general contract to the Austin Co. for proposed additions to its plant at Fleetwood, Pa. Three two-story and basement buildings will be erected, 102 x 105 ft., 66 x 140 ft., and 70 x 95 ft., with one-story extension, 70 x 95 ft. The expansion will cost close to \$500,000 and will more than double the capacity of the plant.

The Penn Central Light & Power Co., Altoona, Pa., will proceed with extensions and betterments in its steam-oper-

ated electric generating plant on the Juniata River, with the installation of machinery to increase the capacity from 45,000 to 75,000 hp. Extensions will be made in transmission system. The expansion is reported to cost close to \$2,500,000. The company is disposing of a preferred stock issue, a portion of the proceeds to be used for the work. Albert Emanuel is president.

The Philadelphia Suburban Water Co., Sixteenth and Market Streets, Philadelphia, has plans under way for a new pumping plant at Phoenixville, Pa., in connection with a proposed filtration plant. It is expected to ask bids early in March. The entire project will cost approximately \$1,200,000 with machinery. C. E. Davis is general manager.

The Nazel Engineering & Machine Works, 4041 North Fifth Street, Philadelphia, has acquired the slotter division of the T. C. Dill Machine Co., Somerset and Mascher Streets, and will arrange facilities for the manufacture of the Dill slotter machine and parts, with proposed increase in output.

The Lehigh Power Securities Co., 71 Broadway, New York, operated by the Electric Bond & Share Co., has acquired a controlling interest in the Lancaster County Railway & Light Co., Lancaster, Pa., and affiliated organizations. The purchasing company controls the Pennsylvania Power & Light Co., Allentown, Pa., and will connect the acquired system with the lines of this company. Extensions and improvements are planned in power plants and system.

The American Equipment Co., Norristown, Pa., which has been manufacturing bolts, nuts and rivets for about 20 years, has been reorganized with an increase of its capital stock to \$150,000. J. A. Longacre is president, and David Longacre, secretary and treasurer. Harry W. Magee is sales manager.

The Franklin Oil Burner Corporation, recently incorporated with capital stock of \$500,000, will manufacture oil burners suitable for small garages or bungalows. In addition to a factory at 69 Laurel Street, Philadelphia, which the company recently purchased, it has acquired 2½ acres at New Freedom and Clementon Roads, Berlin, N. J., where it will soon build a plant to take care of increased production. It will be in the market for materials and equipment to provide for this expansion.

The Iroquois Electric Refrigeration Co., 1600 Arch Street, Philadelphia, has been incorporated with a capital stock of \$100,000 to market electric refrigerators manufactured in the plant of the Barber Asphalt Co., Buffalo. The Barber Asphalt Co. owns all the capital stock of the Iroquois Electric Refrigeration Co.

The Janney Cylinder Co., Holmesburg, Philadelphia, has been incorporated to manufacture completely machined cylinders in sizes up to 26 in. diameter and 10 ft. long made from any non-ferrous metal. It will specialize in cylinders suitable for pump liners made from a very hard bronze. The company has a plant at 7425 State Road, Philadelphia, and manufacturing operations will begin on Feb. 15. W. T. Janney is president.

South Atlantic States

BALTIMORE, Jan. 25.

TENTATIVE plans are being considered by the Webb Fly Screen Mfg. Co., 216 North Dallas Street, Baltimore, manufacturer of metal screens, weatherstrips, etc., for a one-story addition, to cost \$20,000. R. P. Webb is president.

The Harford Talc Co., Inc., 1801 Chelsea Road, Baltimore, has been making inquiries for a cableway engine, steam or gasoline type.

J. C. Grinnan, Arcade Building, Norfolk, Va., is in the market for a quantity of expansion bolts suitable for fastening furniture to concrete slabs.

The Southern Railway System, 1300 Pennsylvania Avenue, Washington, is said to have plans under way for an ice manufacturing and car-icing plant at Chattanooga, Tenn., to be carried out with a yard and shop expansion program at this point, estimated to cost \$1,000,000.

The Fitkin Utilities, Inc., operated by A. E. Fitkin & Co., 165 Broadway, New York, has acquired the property of the Newport News & Hampton Railway, Gas & Electric Co., Newport News, Va., and will consolidate with the Virginia-Western Power Co., and its other electric utilities in this section. Plans are under consideration for extensions.

The C. Hoffberger Co., 538 East Monument Street, Baltimore, operating ice and refrigerating plants, has filed plans for an addition to its ice-manufacturing plant at Braddish Avenue and Baker Street to increase the output from 100 to 200 tons per day. C. Hoffberger is president.

The Eastern Shore Gas & Electric Co., Salisbury, Md., has decided not to rebuild its power plant at Ocean City, Md., recently destroyed by fire, as previously reported, and is

completing plans for the construction of a transmission line, with power substation, to cost \$50,000.

The Washington Steel Products Co., Smith Building, 815 Fifteenth Street, N. W., Washington, has been making inquiries for a number of railroad flat cars, 42-in. gage; also for two lumber trucks, light type, 36-in. gage.

The Mitchell & Dunning Co., Aulander, N. C., is desirous of getting in touch with a shop in position to contract for the manufacture of a quantity of patented rivet holders. L. T. Dunning is general manager, in charge.

A. J. Cottingham, Brookman, Ga., has been making inquiries for a number of logging cars, 26-in. gage.

The Snidow-McWane Furniture Co., Inc., Kuse Building, Lynchburg, Va., has plans under way for a new one-story factory, 60 x 350 ft., to cost \$35,000, of which close to \$15,000 will be expended for equipment. George C. Walker is secretary.

The Georgia Railway & Power Co., Atlanta, Ga., plans an expenditure of about \$4,000,000 during 1926 for additional power development in the northern part of the State.

The Board of Awards, City Hall, Baltimore, is asking bids until Feb. 3 for electrical equipment for installation at the filtration plant at Montebello. V. Bernard Siems is water engineer.

The Atlantic Creosoting & Wood Preserving Co., Bank of Commerce Building, Norfolk, Va., has perfected arrangements for a merger with the Savannah Creosoting Co., Savannah, Ga., under the direction of the American Creosote Works, Inc., 1305 Dublin Street, New Orleans. A large tract has been acquired on the Elizabeth River at Portsmouth, Va., as a site for a new creosoting works, including power house, machine shop and miscellaneous structures, to cost \$350,000 with machinery. A lumber and wood-working plant will be installed for the fabrication of timbers for bridge construction and other structural work. W. H. Wales is general manager of the Atlantic company.

The Board of Education, Staunton, Va., contemplates the installation of manual training equipment in its proposed high school, to cost \$200,000, for which superstructure will soon begin. T. J. Collins & Son, Staunton, are associated architects.

Samuel T. Williams, 8 East Lexington Street, Baltimore, engineer, has inquiries out for a traveling crane, locomotive type, about 10 tons capacity, 40-ft. boom.

The Virginia Electric & Power Co., Richmond, Va., has acquired the electric light and power plant at Tappahannock, Va., and has tentative plans for extensions and the installation of additional equipment.

The Taylor-Parker Co., Water Street, Norfolk, Va., has been making inquiries for a pipe machine, about 6-in. diameter capacity.

R. P. Johnson, Wytheville, Va., machinery dealer, has inquiries out for a jaw crusher, about 9 x 12 in., mounted or unmounted, with elevator, screen and accessories; also for a hollow chisel mortiser, about ¾-in. cut, with 4-in. stroke; filter equipment for a 50-ton capacity ice plant, and a 200-ton hydraulic wheel press, preferably motor driven.

The Shenandoah River Light & Power Corporation, Luray, Va., has acquired the uncompleted hydroelectric power plant of the Valley Power Co., now defunct, on the Shenandoah River, near Harrisonburg, Va. The new owner is reported as considering tentative plans for the completion of the station and the installation of machinery, to cost close to \$200,000.

The Board of District Commissioners, District Building, Washington, is said to be planning the installation of manual training equipment in its proposed two-story Stewart junior high school on D and E Streets, N. E., to cost \$475,000, for which bids on a general contract will soon be asked. A. L. Harris, District Building, is municipal architect.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has been making inquiries for a marine type crude oil engine, about 100 hp.

The Town Council, Roxboro, N. C., is considering the installation of pumping machinery in connection with proposed extensions and improvements in the municipal water-works and sewage system. Spoon & Lewis, American Bank Building, Greensboro, N. C., are consulting engineers.

The R. J. Reynolds Tobacco Co., Winston-Salem, N. C., has filed plans for a new steam-operated power plant for auxiliary service to cost \$75,000. J. E. Sirrine & Co., Greenville, S. C., are engineers.

Willys-Overland, Inc., will erect a \$600,000 plant and distributing and service station in Atlanta, Ga. The building will be three stories with a total floor space of 76,000 sq. ft.

The M. P. Moller Motor Car Co., Hagerstown, Md., has been incorporated to take over the business conducted by M. P. Moller individually but trading as the M. P. Moller Motor Car Co. The change from individual ownership to a

corporation signifies no change in the plans of the company, which will continue to manufacture the Dagmar pleasure passenger automobile and the Astor and Moller taxicabs.

The E. J. Talley Laundry Machinery Co., Greensboro, N. C., has been reorganized and recapitalized with \$100,000 stock and will continue to manufacture laundry machinery. No changes in the plant are contemplated just now.

Pittsburgh

PITTSBURGH, Jan. 25.

MACHINE-TOOL business in this market is more encouraging. Sales still run to single items, but are more numerous and in the past week a few good-sized lists have appeared. The Westinghouse Electric & Mfg. Co. has issued a list which includes about a dozen tools and a number of small items. The Carnegie Steel Co. is again moving ahead with plans for betterments and extensions at Mingo, Ohio, and has asked for prices on a number of machine tools. The Weirton Steel Co., Weirton, W. Va., the Pittsburgh Crucible Steel Co., and the Columbia Steel Co., Butler, Pa., also are prospective buyers. Barton Shover, Oliver Building, Pittsburgh, is engineer for the Columbia Steel Co., which will install a 30-in. hot and a 30-in. cold strip mill and will require considerable auxiliary equipment. A few cranes also will be wanted. The Pittsburgh Crucible Steel Co. is to put in a 12-14-in. merchant mill for rolling alloy steel bars and is a probable buyer of cranes.

The United Engineering & Foundry Co., Pittsburgh, has bought a 27-in. x 20-ft. engine lathe, an 8-ft. radial drill and a 6-ft. radial drill. The Pittsburgh Steel Products Co., Pittsburgh, bought a 6-ft. horizontal boring mill.

Plans have been filed by the Vitro Mfg. Co., Bessemer Building, Pittsburgh, manufacturer of enamels, etc., for a one-story addition to its plant at 729-31 Fairston Avenue to cost \$21,000.

The Equitable Meter & Mfg. Co., Pittsburgh, has been organized to take over and expand the Equitable Meter Co., 424 First Avenue, and to acquire the assets of the Pittsburgh Model Engine Co., with plant in the Homewood district. The new company is capitalized at \$1,500,000 and contemplates extensive increase in the manufacture of gas meters, gas regulators and kindred apparatus. Early in the spring the present plant of the meter company will be removed to the Homewood works which aggregates about 225,700 sq. ft. of floor space. Additional machinery will be installed. The plant has been idle for some time, being previously given over to the manufacture of automobile engines. W. F. Rockwell, formerly president Wisconsin Motor Parts Co., Oshkosh, Wis., is president of the reorganized meter company; T. H. Gillespie is treasurer, and Col. Paul R. Hawkins, secretary.

The Catholic Diocese of Pittsburgh, Rt. Rev. Hugh C. Boyle, Craig Street and Fifth Avenue, Pittsburgh, is considering the installation of a manual training department in its proposed four-story and basement high school for boys to cost \$400,000. E. J. Weber, Knights of Columbus Building, is architect.

The Ritter Brothers Lumber Co., Airbrake Avenue, Turtle Creek, Pa., is completing plans for the early rebuilding of the portion of its two-story mill, 70 x 100 ft., recently destroyed by fire. The new structure will cost about \$42,000 with equipment.

The General Sand & Supply Co., Columbia Bank Building, Pittsburgh, recently organized under Delaware laws, has construction under way on a new sand and gravel plant at Wellsville, Ohio, where an 8-acre tract has been acquired on the Ohio River waterfront. Complete loading, conveying and handling equipment will be installed. The plant will cost close to \$200,000 with site. The company is disposing of a preferred stock issue of \$260,000, a portion of the proceeds to be used for the new works. B. B. Byers is one of the heads.

The Mill Creek & Elkhorn Coal & Coke Co., Coopers, W. Va., recently organized to take over and consolidate the Mill Creek Coal & Coke Co., and the Elkhorn Coal & Coke Co., has plans for the construction of a tippie at the mines of the last noted company, Mill Creek district, to cost close to \$100,000 with machinery. Other machinery will also be installed. C. B. Smith is general manager.

The Midwest Steel & Supply Co., Bradford, Pa., J. Hillstrom, general manager, is said to be contemplating the

erection of an addition to its plant at East Bradford. A two-story and basement office building will also be erected.

New interests, headed by Floyd H. Newmaker and P. C. Ostergard, Warren, Pa., have acquired a controlling interest in the Samuel Peterson Co., Inc., 405 Laurel Street, manufacturer of chairs, turned wood products, handles, etc., with branch mills at Titusville, Pa., Dyersburg, Tenn., and St. Francis, Ark. Plans are under way for extensions in the Warren factory, as well as one of the Southern plants, with the installation of considerable additional machinery.

Ovens, power equipment, conveying and other machinery will be installed in the proposed three-story and basement plant to be erected by the Ward Baking Co., 3100 Liberty Avenue, Pittsburgh, to be 100 x 200 ft., estimated to cost \$325,000 with machinery. C. B. Comstock, 110 West Fortieth Street, New York, is architect and engineer. Headquarters are at 367 Southern Boulevard, New York.

Buffalo

BUFFALO, Jan. 25.

A BOND issue of \$10,000,000 is being sold by the Buffalo General Electric Co., Electric Building, Buffalo, a portion of the fund to be used for extensions and improvements in 1926. It is proposed to enlarge present steam-operated electric power plants to increase the output by 80,000 hp., build additional power substations, transmission lines, etc. Charles R. Huntley is president.

Locke & Co., Inc., 453 East Fifty-sixth Street, New York, manufacturer of automobile bodies, with branch plant at Detroit, has acquired the factory of the Symington Co., Rochester, N. Y., formerly given over to the manufacture of firearms, and will establish a new works. It is purposed to remove the Detroit business here. About 1000 will be employed.

The Ford Vending Machine Co., 605 Oakwood Avenue, East Aurora, N. Y., Ford Mason, treasurer and general manager, is planning for a two-story factory, 32 x 68 ft., at Lockport, N. Y., for the manufacture of vending machines and parts. It is expected to ask bids on a general contract early in the spring.

The Atlas Pattern Works, 234 Fourth Street, Buffalo, is said to be planning the installation of equipment for the manufacture of metal and wood patterns at its plant on West Avenue.

The American Radiator Co., 1807 Elmwood Avenue, Buffalo, manufacturer of steam-heating equipment, is considering plans for extensions, including an addition to the malleable iron department, extension in annealing division, addition to core department and other divisions, reported to cost more than \$1,000,000 with equipment. The company has filed plans for immediate expansion, including a new factory to cost \$100,000 with machinery. Headquarters are at 40 West Fortieth Street, New York.

The F. B. Rae Oil Co., foot of Ambrose Street, Rochester, N. Y., is considering the erection of a one-story storage and distributing plant to cost about \$35,000. J. S. Keisel is company engineer.

The Depew & Lancaster Light, Power & Conduit Co., Lancaster, N. Y., will acquire the electric power properties of Fred W. Young in this vicinity for a consideration of \$359,674. Plans are under advisement for extensions in power plants and system, including additional transmission lines.

The Federal Cement Co., organized by interests connected with the Buffalo Slag Co., Ellicott Square Building, Buffalo, and the Standard Slag Co., Youngstown, Ohio, has plans under way for the construction of a new cement mill in the vicinity of Buffalo to cost approximately \$1,500,000. A similar plant is projected near Cleveland, to cost close to a like amount. The Bethlehem Steel Co., Bethlehem, Pa., is interested in the new company. L. A. Beeghly, head of the Standard Slag Co., will be an official of the cement organization.

The Board of Education, Oakfield, N. Y., plans the installation of manual training equipment in its proposed high school estimated to cost \$325,000, for which superstructure will begin in about 60 days.

The Art Metal Construction Co., Jones Street and Gifford Avenue, Jamestown, N. Y., manufacturer of metal furniture and cabinets, will soon ask bids for a three-story addition, 50 x 115 ft., to cost \$50,000. Oliver R. Johnson, Fenton Building, is architect. Henry K. Smith is president.

The Porter-Cable Machine Co., Syracuse, N. Y., has received an order from England for nine Porter-Cable production lathes. The company reports that its foreign sales recently have been quite encouraging.

Detroit

DETROIT, Jan. 25.

WORK will soon begin on a one-story addition at the plant of the Oakland Stamping Machine Co., Rochester, Mich., to cost \$25,000 with equipment. E. S. Stryker is president.

The Lake Independence Co., Marquette, Mich., will soon begin rebuilding the portion of its plant recently destroyed by fire, with loss of about \$350,000 including equipment. The work will include a shop for the manufacture of automobile body parts, planing mill and other wood-working structures.

The City Council, Flint, Mich., plans to ask bids during February for a proposed one-story sewage pumping plant, with power equipment, pumps and accessory apparatus, at Gilkey Creek, to cost \$100,000. George M. Osborn, City Hall, is city engineer.

The American Standard Tool Works, Inc., Pontiac, Mich., is said to be planning the installation of additional equipment at its plant to cost more than \$100,000.

The Baldwin Rubber Co., Pontiac, Mich., manufacturer of rubber mats and kindred products, is considering plans for enlargements, with the installation of additional machinery to more than double the present output. The expansion will cost in excess of \$75,000. Russell H. Baldwin is president.

The Detroit City Gas Co., Clifford Avenue, Detroit, has plans for a three-story automobile service, repair and garage building, 160 x 200 ft., for company motor trucks and cars, estimated to cost \$150,000 with equipment. Weston & Ellington, Stroh Building, are architects.

The Campbell-Ollier Transmission Co., Buchanan, Mich., recently organized, will take over the local plant and business of the Campbell Transmission Co., manufacturer of automobile shaft transmission equipment, and contemplates expansion. It is purposed to remove the manufacturing division to South Bend, Ind., where new shops will be established, retaining the experimental and designing shops at Buchanan.

The Ford Motor Co., Detroit, is said to have plans under way for the rebuilding of the portion of the plant of the Stout Metal Airplane Co., Dearborn, Mich., a subsidiary, destroyed by fire Jan. 17, with loss reported at \$250,000 including equipment. In connection with the reconstruction it is purposed to enlarge the experimental laboratory and other departments, with cost estimated at \$400,000. A new airplane hangar will also be built.

The City Council, Muskegon, Mich., contemplates the installation of pumping machinery in connection with a proposed sewage disposal plant estimated to cost \$1,000,000. Plans will be drawn by the city engineer.

The C. G. Spring & Bumper Co., 2642 East Grand Boulevard, Detroit, has awarded a general contract to the Cooper-Widenmann Construction Co., 4612 Woodward Avenue, for a two-story and basement addition, including alterations and improvements in the present factory, to cost \$50,000. Van Leyen, Schilling & Keough, 3440 Cass Avenue, are architects. Christian Girl is president.

The Francis Stone Co., Monroe, Mich., is completing plans for rebuilding its stone-working plant destroyed by fire several months ago with loss reported at \$250,000 including machinery. The reconstruction will cost a like sum.

Fire, Jan. 14, destroyed a portion of the plant of the American Wood Rim Co., Onaway, Mich., manufacturer of automobile rims, etc., with loss reported at \$500,000 including machinery. Plans for rebuilding are under consideration.

The Tibbitts Heater Co., Saginaw, Mich., has been organized and in a small way is manufacturing heating devices for automobiles. The company at present is building heaters for Ford, Chevrolet, Hudson and Essex automobiles. Expansion of the business is contemplated but probably will not take place until fall.

The Lock Pattern & Machine Co., Detroit, has bought a 14-in. vertical surface grinder; the Briggs Mfg. Co., Detroit, a vertical shaper, and the Ford Motor Co., Detroit, a vertical shaper; the Reo Motor Car Co., Lansing, Mich., a deep-hole drilling machine.

The Hydraulic Pressed Bearing Co., Niles, Mich., is getting machinery into its new plant. The first hydraulic press and pump unit has reached the plant. Manufacture of babbitt bearings by the pressure process is to be undertaken. Bearings of this nature are designed for automobile engines, stationary engines, compressors, pumps, electric motors and machinery of all kinds. The pressure process is said to eliminate porosity, shrinkage strains, cracks, fissures and segregation, because the metal is never brought to a molten state.

Cleveland

CLEVELAND, Jan. 25.

MACHINE tool business has been quiet, sales being lighter than during the previous week. Inquiries are few. While little business is coming from automobile manufacturers, some makers of parts in the Detroit territory are figuring on additional equipment. Cleveland machine tool manufacturers are working on the list recently issued by the Illinois Central Railroad. A local turret lathe manufacturer has booked a good volume of orders for single machines this month. The Cleveland Planer Co. has taken a 48-in. machine for the Wolf Mfg. Co., Chicago.

Two cement plants will be erected in Cleveland during the year. One will be built by the Universal Portland Cement Co., a subsidiary of the United States Steel Corporation, which has acquired a 35-acre site in the Cuyahoga River valley and the other will be erected by the Federal Cement Co., in which the Standard Slag Co., Youngstown, is said to be interested. Both plants will involve an expenditure of \$4,000,000.

The DeVilbiss Co., Toledo, Ohio, maker of a spraying equipment, is having plans prepared for a three-story and basement factory, 80 x 580 ft. Mills-Rhines-Bellman & Nordhoff are the architects.

The American Can Co., Toledo, Ohio, has placed a general contract for a one-story factory, 59 x 271 ft., with A. Bentley & Co., of that city.

The Rickersberg Brass Co., Perkins Avenue and East Thirty-seventh Street, Cleveland, is planning a one-story factory addition.

The buildings, land and equipment of the Hunter Crucible Steel Co., Cleveland, have been put in the hands of F. H. Crawford & Co., 299 Broadway, New York, for liquidation. The equipment consists of melting furnaces, rolling mills, forging machinery, machine tools and cranes.

The Vitrified Iron Products Co., Clyde, Ohio, Harry Warman, president, is enlarging its enamel shop. A new Alundum furnace is being installed by the Ferro Enamel Supply Co.

In the recently published announcement of the consolidation of the Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio, and the Kent Machine Co., Kent, Ohio, S. B. Beck was erroneously mentioned as secretary and general manager of the Kent company. A. B. Babbitt is secretary and general manager of the company and has held this office for several years.

The addition to the plant of the Grabler Mfg. Co., Cleveland, will be completed about Feb. 1. It is six stories, 60 x 221 ft., with L, 55 x 60 ft., and will provide about 100,000 sq. ft. of additional floor space. L. Rosenfeld is president and W. S. Bayer, secretary.

Chicago

CHICAGO, Jan. 25.

THE outstanding development of the week in the Chicago machine-tool market is a list of 28 tools, largely motor-driven, issued by the Chicago & North Western Railroad. The New York Central is inquiring for three 4-ft. radial drills and several double dry grinders with 18-in. wheels. The Pullman Car & Mfg. Corporation has bought a 42 x 42-in. x 14-ft. planer, and is understood to have closed against a list for its Michigan City shops and to have purchased, in addition, four axle journal lathes. The Gardner-Morgan Electric Co., Chicago, is said to have purchased the larger part of its list. The Allis-Chalmers Mfg. Co., Milwaukee, is inquiring for a 6-ft. radial drill and other machine-tool equipment.

Dealers find that actual purchases have not increased, but inquiries are fairly numerous and come from a wide diversity of industries. Small and medium-sized tools are much more active than larger machines. Used equipment is in good demand. Prices are steady and deliveries are much the same as heretofore.

The Chicago & North Western List

Two double-head emery wheel grinders with 18 x 2½-in. wheels, similar to Ransom No. 131.

One double-head tool grinder with 18 x 2½-in. wheels.

One double-head dry emery wheel grinder equipped with 18 x 2½-in. wheels.

One 16-in. x 8-ft. selective geared-head engine lathe, equal to Ryerson-Conradson, 4-ft. 6-in. between centers.

One 16-in. x 10-ft. Prentice or equal geared-head engine lathe, 6-ft. between centers, with taper attachment.

One open gap punch and shear, 36-in. throat, similar to Cleveland No. C.

One 20-in. x 8-ft. lathe, similar to the Conless machine of Boye & Enimes, 47½-in. between centers, with taper attachments.

Four 75-ton Chambersburg or equal hydro-pneumatic bushing presses, model B.

One double-head emery wheel grinder, similar to Ransom No. 131, with 18 x 2½-in. wheels.

One 24-in. end-room shaper with tilting table and swivel vise.

One 32-in. Cincinnati or equal heavy-duty shaper.

One Ryerson or equal combination hot saw and tube expanding machine for 5½-in. tubes.

One 40-in. heavy-duty upright drill press equipped with compound table.

Two 15-in. x 5-ft. Monarch or equal portable geared-head engine lathes, distance between centers 28½-in., with taper attachment.

One Micro internal grinder, model FG., equipped with air pump grinding attachments.

Two 75-ton Chambersburg or equal hydro-pneumatic bushing press, model B.

One new Doty or equal flange clamp, size E, capacity plate 10-ft. wide.

Two Ryerson or equal universal elliptical spring forming machines, size ¾-in. x 7½-in. x 96-in., air operated.

One 12-in. x 8-ft. Underwood or equal cylinder boring bar.

One Marsh or equal portable crank pin turning machine.

One 4-in. capacity McCabe pneumatic flanger.

Bidders on these tools are asked to name the make of the motor, with full specifications and the maker's guarantee. Bids must be in to P. J. Berck, general purchasing agent, Chicago, by Jan. 28.

The Chicago Automatic Conveyor Co., 37 West Van Buren Street, Chicago, has purchased three acres at the corner of West Seventy-fourth Street and Oakley Avenue.

The American Stamping Works, 219 South Peoria Street, Chicago, manufacturer of steel ceilings, is receiving bids through M. H. Harris, 11 South La Salle Street, on a two-story factory, 25 x 75 ft., to cost \$25,000.

The Maremont Mfg. Co., 1600 South La Salle Street, Chicago, manufacturer of wagons, will build a two-story factory, 130 x 215 ft., at 1601 South Ashland Avenue, to cost \$150,000. Halperin & Braun, 19 South La Salle Street, is architect.

The Barrett-Cravens Co., 1328 West Monroe Street, Chicago, manufacturer of industrial tractors, portable elevators and lift trucks, has purchased a building at Thirtieth Street and Spaulding Avenue, Chicago, containing 75,000 sq. ft. of floor space, to provide for expanding business. This is the second building the company has bought within three years.

The Economy Heat Unit Co., 1625 Hennepin Avenue, Minneapolis, Minn., has been organized to manufacture oil burners and heating systems. L. H. Fawkes is president and C. M. Stroud is vice-president and general manager.

Bids have been asked by the Waukegan Foundry Co., Terminal Building, Waukegan, Ill., for a new one and two-story foundry, 90 x 250 ft., to cost \$50,000. Josiah L. Rice, 4213 North Ashland Avenue, Chicago, is architect. A. K. Barr is general manager.

The Benjamin Electric Mfg. Co., 120 South Sangamon Street, Chicago, has awarded a general contract to the Austin Co. for a one-story plant, 90 x 140 ft., at Des Plaines, Ill., to cost approximately \$65,000. R. B. Benjamin is president.

The Board of Education, Duluth, Minn., is said to be planning the installation of manual training equipment in the proposed two-story and basement addition at the Central high school to cost \$250,000. Holstead & Sullivan, Palladio Building, are architects.

The Dowst Brothers Mfg. Co., 120 Ann Street, Chicago, manufacturer of toys, etc., has plans for a four-story and basement factory, 100 x 100 ft., to cost \$210,000 with machinery. A. S. Abschuler, 28 East Jackson Boulevard, is architect. George E. Lawson is president.

The Metropolitan Utilities District, City Hall, Omaha, Neb., will soon take bids on a general contract for a two-story automobile service and repair shop, and garage for

municipal cars, to be 150 x 160 ft., estimated to cost \$200,000 with equipment. T. A. Leisen is architect and engineer. R. A. Loussler is secretary.

The Sioux City Service Co., Sioux City, Iowa, operated by the Sioux City Gas & Electric Co., is disposing of a bond issue of \$1,350,000, a portion of the fund to be used for extensions and improvements in power plants and system. W. F. Bertke is vice-president.

The Gardner Governor Co., Quincy, Ill., manufacturer of engine governors, power control apparatus, etc., has plans for a one-story foundry addition, 100 x 245 ft., to cost about \$65,000. Frank D. Chase, Inc., 720 North Michigan Avenue, Chicago, is architect and engineer.

The Standard Oil Co., Decatur, Ill., will build a two-story machine shop, 50 x 150 ft., at 400 East Cerro Gordo Street. J. A. Biddle is manager.

Rega & Weiner, 1330 West North Avenue, Chicago, manufacturers of automobile bodies, will build a one-story factory, 75 x 155 ft. Harry Dalsey, 2321 West North Avenue, is architect.

The Wittenmeier Machinery Co., 815 North Spaulding Avenue, Chicago, will build a one-story shop, 37 x 102 ft., at 853 Christiania Avenue. R. Hockmuth & Co., 1930 Orchard Street, are the general contractors.

The Chicago Hardware Foundry Co., North Chicago, Ill., will build an addition to its plant for increased output. It has bought the Dry Blow Co., Syracuse, N. Y., manufacturer of electrical hand dryers, and will move the business to North Chicago.

Gulf States

BIRMINGHAM, Jan. 25.

FOLLOWING its recent organization under Delaware laws with capital of \$7,000,000, the Dixie Pulp & Paper Co., Union Indemnity Building, New Orleans, E. G. Simmons, vice-president and general manager, has authorized plans for a new paper and pulp mill at Morgan City, La., where a large tract has been acquired. The plant will consist of several units to be devoted to the production of book papers, and will include power house, machine shop and miscellaneous structures to cost \$2,500,000. E. A. McIlhenny is president, and Benjamin C. Brown, secretary.

The East Texas Public Service Co., Marshall, Tex., will build a one-story ice-manufacturing plant with initial capacity of 70 tons per day, estimated to cost \$100,000, of which more than one-half will be expended for machinery.

The Lucas Oil & Refining Co., Grand Prairie, Tex., recently organized, has acquired the local plant of the former State Refining Co. The new owner will remodel and install additional machinery.

Harry J. Frahn & Co., Florence, Ala., architects, have plans for a new multi-story automobile service, repair and garage building, 55 x 150 ft., at the Jackson Highway and Thirtieth Street, to cost approximately \$100,000 with equipment.

John K. Spaulding, Fullerton, La., machinery dealer, has inquiries out for an oil-operated engine, about 35 hp., for a proposed local cotton gin; also for belting, shafting and other transmission equipment, for one 2-stand, 70-saw cotton gin, double box press type.

The City Ice Co., Vicksburg, Miss., is arranging for a new one-story ice-manufacturing plant to cost about \$60,000 with equipment. J. L. Blackwell, Vicksburg, is architect and engineer.

The Texas-Pacific Coal & Oil Co., Fort Worth, Tex., has work in progress on enlargements and betterments in the local refinery recently acquired from the Montrose Oil Refining Co., to include a new building and the installation of considerable machinery.

The Long-Lewis Hardware Co., Bessemer, Ala., will soon ask bids for the erection of a new four-story and basement storage and distributing plant on First Avenue North, to cost \$100,000 with equipment. John B. Perry is president.

The O. M. Gwin Construction Co., New Orleans, has inquiries out for a crawler type traveling crane, with 1-yd. capacity clamshell bucket.

The Louisiana Oil Refining Corporation, Shreveport, La., with refinery at Gas Center, La., is arranging for a preferred stock issue of \$4,000,000, of which more than \$1,000,000 will be used for extensions and improvements in oil refineries, including the installation of additional machinery.

W. F. and M. D. Kennemer, 5327 Vanderbilt Street, Dallas, Tex., are arranging for a new one-story ice-manufacturing plant at San Angelo, Tex., estimated to cost close to \$90,000 with machinery.

The Alabama Water Co., Attalla, Ala., is planning for the early construction of a pumping plant in connection with extensions and improvements in the local water system. A site has been acquired at Eighth Avenue and Third Street. A fund of \$75,000 is available for the work.

J. L. Cobbs, city treasurer, Montgomery, Ala., will receive bids until Feb. 16 for one motor-driven centrifugal pumping unit, with capacity of 4200 gal. per min. J. W. Billingsley, Interstate Bank Building, New Orleans, is consulting engineer.

The Santa Rosa Cement Co., recently organized by Charles L. Hall, Nashville, Tenn., and associates, to construct and operate a new mill at St. Stephens, Ala., has engaged Ellis Super, 152 West Forty-second Street, New York, as consulting engineer. The mill will operate under the wet process and is being designed for an initial daily production of 5000 bbl. It is expected to have the first unit ready for service before the end of the year. The plant will cost close to \$1,000,000 and will be supplemented with a number of packing plants at Mobile, Ala., Tampa, Fla., and New Orleans. The H. K. Ferguson Co., Euclid Avenue, Cleveland, has the contract for the buildings.

The City Council, Tallahassee, Fla., will receive bids until Feb. 9 for electric and other equipment for waterworks service, including one 120-kw. generator, direct-connected to internal combustion engine of 240-hp. rating, with exciter, meter, etc.; switchboard and instruments; deep-well pumping machinery and accessories. William R. Galt is city manager.

The City Commission, Gainesville, Fla., George Cairns, city manager, is considering extensions and improvements in the municipal electric light and power plant, including the installation of additional machinery.

The Tampa Lumber & Mfg. Co., 210 North Rome Street, Tampa, Fla., is in the market for wood-working machinery for a local plant. Plans are under way for the erection of three one-story units, 100 x 130 ft., and two each 32 x 120 ft. Completed it will cost close to \$75,000. Franklin O. Adams, Grand Theater Building, is architect.

Plans have been prepared for the erection of a Portland cement works in a suburb of Birmingham by Lindley Morton of that city, who recently sold a plant in North Birmingham to the International Cement Co. and who also owns a plant at Nazareth, Pa. When completed it will represent an investment of \$3,000,000.

The Peck Safety Windshield Corporation, whose temporary address is 130 West Bay Street, Jacksonville, Fla., has been incorporated under the laws of Delaware with 100,000 shares of stock of no par value. The company will go into business in Detroit and is negotiating for control of a plant in that city now manufacturing automobile bodies. It also plans to acquire a glass plant and a plant manufacturing trucks and buses.

St. Louis

ST. LOUIS, Jan. 25.

BIDS will be received by the Board of Public Service, St. Louis, until Feb. 16 for pumping machinery, tanks and auxiliary equipment for a proposed filter plant for the municipal water system. The water commissioner, room 312, City Hall, is in charge.

The W. C. Norris Mfg. Co., 6 North Frisco Street, Tulsa, Okla., has work under way on a new one-story and basement machine shop, 32 x 80 ft. W. C. Norris is president.

Floyd L. Weakley, Sharp Building, Kansas City, Mo., architect and engineer, has inquiries out for conveying equipment for a proposed garbage disposal plant; also for condenser apparatus, boilers, tanks and accessory equipment; digesters, evaporators and kindred machinery; steel tanks, pumping apparatus, etc.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is said to have closed negotiations for property at St. Louis as a site for a proposed plant to manufacture lighting standards and kindred electrical products. The initial works are reported to cost close to \$800,000 with machinery.

The Tonkawa Ice Co., Tonkawa, Okla., has filed plans for the construction of a one-story addition to its ice-manufacturing plant to cost \$25,000.

The Missouri Hydroelectric Power Co., care of the Charles B. Hawley Engineering Corporation, Munsey Building, Washington, has received permission to proceed with the construction of its proposed hydroelectric power development on the Osage River, near Bagnell, Mo. The entire project with transmission system will cost close to \$12,000,000. The Hawley company is engineer for the work.

The Common Council, Deepwater, Mo., plans the installation of pumping equipment in connection with proposed extensions and improvements in the municipal waterworks, for which a bond issue of \$45,000 has been arranged. Russell & Axon, McDaniel Building, Springfield, Mo., are engineers.

The Seaman Body Corporation, 1732 Richards Street, Milwaukee, Wis., is reported to have tentative plans under consideration for a new branch plant at Pine Bluff, Ark., for the manufacture of automobile bodies.

The Seymore Packing Co., Topeka, Kan., will soon begin the construction of a five-story and basement cold storage and refrigerating plant, 50 x 150 ft., to cost \$150,000 with machinery. Hans von Unwerth, Finance Building, Kansas City, Mo., is architect and engineer.

The St. Joe Lime & Stone Co., St. Joe, Ark., has acquired the plant and property of the Moss DeVoy Lime & Stone Co., 313 Adams Street, Memphis, Tenn. The new owner plans extensions and the installation of additional hydrating and other machinery, estimated to cost \$50,000. Headquarters will be established at 120 East Third Street, Little Rock, Ark. John O. Wilson is president.

The Mapes Consolidated Mfg. Co., Griffith, Ind., has superstructure nearing completion for its proposed one-story plant, 200 x 250 ft., for the manufacture of paper products at North Kansas City. It is estimated to cost \$125,000 with machinery. Clifton B. Sloan, 321 East Eleventh Street, is architect.

The Common Council, Collinsville, Okla., plans the installation of three high pressure boilers and auxiliary power equipment for the municipal pumping station to cost \$35,000. The Holway Engineering Co., Wright Building, Tulsa, Okla., is engineer.

The Kansas City Hay Press Co., foot of the Fourth Street viaduct, Kansas City, Mo., will erect a one-story machine shop addition, 70 x 180 ft., to cost \$23,000 with equipment.

The Murray Co., Dallas, Tex., bought a side-head boring mill from the Niles-Bement-Pond Co.

A partnership business known as the Industrial Wire & Iron Works, 2906 East Eighteenth Street, Kansas City, Mo., has been incorporated as the Heuler Wire & Iron Works, Inc., same address. Officers are: C. A. Heuler, president; R. C. Heuler, vice-president, and Harry H. Heuler, secretary-treasurer. The company manufactures ornamental wire and iron products. No changes are contemplated in the business.

The Davis Die & Mfg. Corporation, recently organized, has rented premises at 2311 East Twelfth Street, Kansas City, Mo., and will manufacture tools, dies, etc., with a special view to supplying patterns and models to inventors who wish to apply for patents. It will also manufacture such patented articles as may be found worthy of placing on the market.

Indiana

INDIANAPOLIS, Jan. 25.

PLANs are being arranged by the Johann Mfg. Co., Evansville, Ind., recently formed with a capital of \$250,000 to manufacture commercial automobile bodies, for the erection of a one-story plant, 100 x 100 ft., to cost approximately \$25,000. William Johani is president.

The American Vitrified Products Co., Brazil, Ind., manufacturer of sewer pipe, etc., is considering rebuilding the portion of its plant destroyed by fire Jan. 18, with loss estimated at \$300,000 including machinery. Headquarters are at Akron, Ohio.

The Board of Education, 150 North Meridian Street, Indianapolis, plans the installation of manual training equipment in the proposed two-story and basement Shortridge high school, estimated to cost \$1,200,000, for which foundations will soon be laid.

The Knox Consolidated Coal Co., Indianapolis, is considering rebuilding the portion of the power house at its Bruceville mine, near Bicknell, Ind., destroyed by fire Jan. 13, with loss reported at \$25,000 including equipment. It is also contemplating rebuilding the tippie at its Indian Creek mine partially destroyed by fire on Jan. 2, with loss approximating \$65,000 with machinery.

The Board of School Trustees, Akron, Ind., has authorized the installation of a manual training department in the proposed new high school, to cost \$90,000, for which plans are being drawn by Griffith & Goodrich, 211 East Berry Street, Fort Wayne, Ind., architects.

The Merchants Heat & Light Co., Meridian and Washington Streets, Indianapolis, will build a one-story machine and repair shop, 35 x 45 ft., at its proposed substation. A traveling crane will be installed. The complete project will cost close to \$100,000.

Rex Sample, Anderson, Ind., operating a service, repair and garage building near the Union Traction Station, has plans under way for a one-story shop and garage addition, 100 x 100 ft., to cost \$50,000 with equipment. Work will begin in the spring.

The Board of Education, Terre Haute, Ind., plans the installation of manual training equipment in its proposed new junior high school, to cost \$550,000, for which bids are being asked on a general contract until Feb. 1. Johnson, Miller, Miller & Yeager, Terre Haute, are architects.

The Rotary Air Pump Co., 216 East Ninth Street, Anderson, Ind., has been organized to manufacture oil pumps. Arrangements have been made for a factory and equipment.

The Western Gas Construction Co., Fort Wayne, Ind., will build a one-story plate shop and welding department, 130 x 145 ft.

George L. Mosker & Co., 100 North First Street, Evansville, Ind., will build a one-story foundry addition, 50 x 150 ft.

The Holt Tool & Engineering Co., 814 East Washington Street, Indianapolis, Ind., will erect a one-story plant, 42 x 90 ft., for the manufacture of screw machines and parts. Charles D. Hoyt is president.

The Cummins Engine Co., Dix and Jackson Streets, Columbus, Ind., manufacturer of screw machines and parts, will soon break ground for the first unit of its proposed new plant, 50 x 150 ft. A second unit, 125 x 290 ft., will proceed early next year. The entire plant will cost approximately \$100,000 with equipment.

The Red Ball Mfg. Co., Frankfort, Ind., manufacturer of Red Ball trucks, is erecting three new buildings. One will be used as a wood-working shop, another as a paint shop, the third as a testing house for motors which the plant will construct for the Red Ball trucks.

Milwaukee

MILWAUKEE, Jan. 25.

INDICATIONS are appearing of improvement in business which has reached a point where enlargement of capacity is gradually becoming necessary in the foundry and machine shop trade in Milwaukee and vicinity. Machine-tool builders and dealers regard this development as a most hopeful sign concerning the future of their business. So far as sales are concerned, January probably will fall below the previous two months, but inquiry is such that February demand is expected to show a substantial increase.

The city of Milwaukee will close bids Feb. 1 on one 16-in. tool room lathe, one 30-in. geared head engine lathe, two ball or roller bearing grinders and one tool room sensitive drill.

The Wehr Steel Co., Milwaukee, manufacturer of steel castings, has placed the general contract with the Klug & Smith Co., consulting engineer, 69 Wisconsin Street, for the construction of a new foundry, 160 x 200 ft., to supplement its present shops at Forty-fifth and Gordon Avenues, in West Allis. The investment in buildings, equipment, etc., will be in the neighborhood of \$150,000. William E. Wehr is president and general manager.

The Milwaukee Flush Valve Co., 121 Reservoir Avenue, Milwaukee, is making extensive improvements in its plant, which include a two-story addition, 40 x 52 ft. The general contract has been awarded to John L. Stanage, 3526 Cedar Street, local.

The Walker Mfg. Co., Racine, Wis., manufacturer of automobile jacks and other equipment, has started work on the construction of an addition to its foundry, of brick and steel, 90 x 121 ft., and 24 ft. high, at Hamilton Street and Michigan Boulevard. It will cost about \$50,000 in the aggregate. The engineers are Battey & Klipp, 123 West Madison Street, Chicago, and the general contractor is C. O. Johnson, 224 Lafayette Avenue, Racine. Willard A. Walker is president and general manager.

The Dillingham Mfg. Co., Sheboygan, Wis., manufacturer of special furniture and other wood products, is inquiring for additional equipment for an ell-shaped factory addition, 38 x 80 and 32 x 80 ft. The company is engaging extensively in the manufacture of household refrigerators. The plant is situated at Wisconsin Avenue and South Water Street. E. A. Stubenrauch, Sheboygan, is the architect.

Ed Schuster & Co., Milwaukee, operating three department stores, have awarded contracts for the erection of a one-story addition, 100 x 150 ft., to their garage and service station at 772-776 Fourth Street, Milwaukee. The project requires considerable miscellaneous tool equipment. A. T. Friedman is president and general manager.

The Milwaukee Department of Public Works, City Hall, will probably be ready Feb. 15 or March 1 to take bids on the construction of a \$400,000 addition to North Point pumping station, at Terrace and North Avenues. The

boiler room addition will be 60 x 176 ft., with two wings, 90 x 40 ft. each, for machine shop, pipe room, chlorine room, etc. The mechanical work is in charge of Cahill & Douglas, consulting engineers, 217 West Water Street, local. Joseph Schwada is city engineer, and H. P. Bohmann, superintendent water department.

The Meta-Mold Aluminum Co., Milwaukee, has been incorporated with an initial capital of \$10,000 to engage in the manufacture of aluminum goods and articles by a new process. The principals are W. D. Bliss, president, and Redmond P. Bliss, vice-president Bliss Brothers Tool Co., 129 Michigan Street, Milwaukee. Plans for production will be divulged as they mature.

Canada

TORONTO, Jan. 25.

DEMAND for machine-tools is chiefly for replacement and is confined mostly to one or two tools to a purchaser. Inquiries, however, are appearing for small lists of a half-dozen machines. It is reported that the automotive industry is preparing for one of the best years in its history and with higher production machinery requirements will correspondingly increase. At present a good demand is appearing for garages and automobile repair plants. Sales of second-hand and rebuilt tools have strengthened in the past 10 days.

Canadian builders report a good volume of business booked and are giving more attention to the export market. Within the past week inquiries for equipment have come from Australia and New Zealand and Dominion producers are making strong bids to capture this business.

The plant of the Electric Steel & Metals Co., Welland, Ont., which has been closed for several years has been sold to the Carbon Alloy Steel Co., Niagara Falls, Ont., for \$100,000. It is understood that the new owner proposes to manufacture steel under a new process from scrap iron obtained from the mines of northern Ontario, not looked upon as refuse.

It is reported that the Quebec Government and the Clarke interests have reached an agreement regarding the erection of a paper mill at the junction of the St. Charles and St. Lawrence rivers at Quebec and construction will begin in the spring. The entire output, it is said, will be shipped to England to be utilized by the Rothermere press. Negotiations have been carried out under Frank and Desmond Clarke and construction work will also be under their direction. It is expected that the mill will be in operation by the spring of 1927.

It is stated that construction work on the Noranda Smelting Co.'s plant in Rouyn township, will start early in the spring. The cost will be between \$4,000,000 and \$5,000,000.

The Duntile Co., 1528 Giles Boulevard, Sandwich, Ont., proposes to start work on the erection of a factory on Bloomfield Avenue, in the spring.

The American Cyanamid Co. has started work on rebuilding its plant at Stirling, N. S.

The Canadian Locomotive Co., Kingston, Ont., has been awarded contract for tank equipment for the plant of the Aluminum Co. of America, now under construction at Chute-a-Caron, Que., at a cost of \$225,000.

The Ontario Hydro Electric Commission, University Avenue, Toronto, will proceed with development of the Alexander Falls on the Nipigon River at a cost of \$7,000,000. This will add some 50,000 hp. to the present development of 65,000 hp. available at Cameron Falls, a short distance from Alexander and will enable the commission to take care of power needs at the Head of the Lakes until about 1930.

Pacific Coast

SAN FRANCISCO, Jan. 20.

HENRY B. KING, Security Building, Long Beach, Cal., and associates have plans under way for a new terminal near the municipal docks on the waterfront. It will include an ice-manufacturing plant, and cold storage plant, 100 x 200 ft.; material-handling and storage facilities, including elevators, conveyors, chutes and other mechanical equipment. The complete project will cost close to \$500,000. Fisher, Lake & Travers, Edwards & Wildey Building, Los Angeles, are architects.

The Southern California Novelty Furniture Mfg. Co., 766 East Twelfth Street, Los Angeles, has tentative plans

for rebuilding the portion of its plant destroyed by fire Jan. 12, with loss estimated at \$50,000 including equipment.

The Southern Sierras Power Co., Riverside, Cal., has plans for an addition to its steam-operated electric generating station at San Bernardino, Cal., to cost \$500,000 with machinery. The work will be carried out in connection with a 1926 expansion program.

The Pasadena Ice Co., Pasadena, Cal., will build an addition to its ice-manufacturing plant at 985 South Broadway, 75 x 110 ft., to cost \$35,000. An electric traveling crane will be installed. Hamm & Grant, Inc., Ferguson Building, Los Angeles, is architect and engineer.

The Southern Pacific Co., 65 Market Street, San Francisco, is completing plans for its proposed new shops at Fresno, Cal., to consist of engine house, machine shop, plate shop, boiler house and other structures. An ice-manufacturing plant and icing station will be built. The entire project will cost more than \$1,000,000 with equipment. The company engineering department is in charge.

The Electrical Products Corporation, Myrtle and Thirtieth Streets, Oakland, Cal., has awarded a general contract to the Austin Co. for an addition to its plant to cost about \$21,000.

The United Verde Copper Co., Clarksdale, Ariz., has plans under way for a new milling plant, reported to cost \$400,000 with equipment. Charles W. Clark is president.

The Best Universal Lock Co., 1121 Post Street, Seattle, has acquired about 5 acres at First Avenue South and Dawson Street, and contemplates the erection of a group of buildings for a new plant, to cost approximately \$500,000 with equipment. John Graham, Dexter Horton Building, is architect.

The Federal Pipe & Tank Co., 5332 Twenty-fourth Avenue, N. W., Seattle, is considering the erection of a two-story addition, 40 x 50 ft.

The plant expansion of the Pacific Coast Forge Co., 3800 Iowa Street, Seattle, manufacturer of spikes, bolts, etc., will consist of four one-story units, 60 x 120 ft., 50 x 175 ft., 35 x 75 ft., and 30 x 60 ft., respectively. Erection will begin soon. The Austin Co. has the general contract.

Cincinnati

CINCINNATI, Jan. 25.

AN increase in machine tool sales the past week has been experienced by local builders. The healthy demand from the general industrial field is the most encouraging feature. In fact, about 75 per cent of the business which has been placed with local manufacturers this month has come from companies in various industries in all parts of the United States.

Inquiries made recently by railroads are on a sufficiently large scale to indicate that carriers are likely to be one of the most important buyers of machine tools this year. The Central of Georgia has put out a list, and the Chicago North Western is taking bids on a number of machines. Action on the Illinois Central inquiry for its Paducah, Ky., shops is expected soon, while the Chesapeake & Ohio is reported to be preparing a list which will be issued in the near future. The Florida East Coast is contemplating the purchase of tools on which bids were asked more than a month ago.

Although scattered orders are being received from automobile makers, local builders are no longer depending upon manufacturers in the Detroit district for the bulk of their business. For example, one of the larger machine tool companies is now securing most of its orders from general manufacturing concerns, whereas a few months ago about 65 per cent of its bookings represented companies in the automotive industry.

Plans are being drawn by the East End Sand & Gravel Co., Chillicothe, Ohio, for a new storage and distributing plant, with mechanical loading, conveying and handling equipment, to cost \$75,000. E. R. Paston is general manager.

The proposed mill of the Fairfield Paper Co., Baltimore, Ohio, will be the first of two individual plant units to be erected at this location. The initial mill will be devoted to the manufacture of corrugated paper, strawboard and kindred specialties. The complete plant will cost close to \$500,000 with equipment. T. D. Griley is president.

The United States Drill Head Co., 1950 West Sixth Street,

Cincinnati, has filed plans for a one-story machine shop addition and other general extensions and improvements.

The Hull-Dobbs Motor Co., Third and Gayoso Streets, Memphis, Tenn., has plans for a two-story service and repair building addition to cost \$60,000 with equipment. Joseph T. Wallace, Bank of Commerce Building, is architect.

The Fowler-Wolfe Boiler Co., Broadway, Paducah, Ky., manufacturer of boilers, tanks and other plate products, is completing plans for the early occupancy of the former local plant of the Lack Mfg. Co., South Third Street. It will be remodeled. E. C. Wolfe is president.

Bids will be received by the City Council, Knoxville, Tenn., until Feb. 16 for equipment for the municipal water-works, including two 15,000,000-gal. per day turbo-centrifugal pumps, two 18,000,000-gal. motor-driven centrifugal pumps, one 4,000,000-gal. motor-driven centrifugal pump, two 500-hp. water-tube boilers, with superheaters, stokers, ash hoppers, etc.; one feed water heater, 2000 hp.; two boiler feed pumps; one weigh larry, 1000-lb. capacity; one 15-ton electric traveling crane, one gantry crane and auxiliary power equipment. Alvord, Burdick & Howson, Hartford Building, Chicago, are engineers.

The Board of Education, Chillicothe, Ohio, plans the installation of manual training equipment in its proposed three-story and basement high school estimated to cost \$300,000, for which bids will soon be asked on general contract. Garver & Woodward, Levern Building, Cincinnati, are architects.

The Chattanooga Implement & Mfg. Co., Chattanooga, Tenn., is considering the erection of a new one-story unit to cost \$100,000 with equipment. E. H. Sholar is president.

L. B. West, Volunteer Life Building, Chattanooga, Tenn., is organizing the Simplicity System Co. to construct and operate a local plant for the manufacture of asphalt-mixing machinery for road-building and other service.

The Kentucky Hydro-Electric Co., Louisville, has plans nearing completion for the construction of a proposed hydro-electric generating plant at Lock 7, Kentucky River, to cost \$600,000 with transmission system. L. F. Harza, 53 West Van Buren Street, Chicago, is architect.

Fire, Jan. 17, destroyed a portion of the Victor Chemical Works, Nashville, Tenn., with loss reported at close to \$500,000 with equipment. It is planned to rebuild. Headquarters are at 343 South Dearborn Street, Chicago.

The Ideal Equipment Co., 369 Dublin Avenue, Columbus, Ohio, is in the market for three modern 500-hp. water tube boilers, Ohio standard, 175 to 200 lb.; two 250-hp., preferably Heine, for Indiana delivery, 160 to 180 lb.; one 800 to 850-kw. engine-driven generator set, generator 3-phase, 60 cycles, 440-660 or 2300 volts. Engine must be Unaflo or Corliss.

Foreign

THE Public Works Supplies and Tenders Board, Wellington, New Zealand, is asking bids until March 23 for electrical equipment for the Arapuni and Manahao power developments, including one dam gate and one tunnel gate complete with controls, circuit breakers, oil filters, oil testing equipment, metering desk, switchboard apparatus, etc.

The Government of Madras, India, has approved plans for a hydroelectric power project in the State, granting permission to a local power company to proceed with development. In addition to power plant, transmission system, etc., an inclined railroad will be constructed. Reserved information on file at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference 193061. The American Consulate, Calcutta, India, Richard D. Simonson, vice-consul, has data regarding the project.

Officials of the International Telephone & Telegraph Co., 41 Broad Street, New York, have formed a Spanish subsidiary to be known as the Standard Electrica Sociedad Anonima, capitalized at 30,000,000 pesetas (about \$4,500,000), to manufacture equipment in Spain. It will take over an existing plant at Barcelona for the manufacture of general telephone equipment, making extensions and improvements; a new plant for the manufacture of wire cables and kindred products will be erected at Santander, and a plant constructed or leased at Madrid for the manufacture of general apparatus. Hernand Behn, executive vice-president of the parent company, will be an official of the new organization.

The State Electricity Commission of Victoria, Melbourne, Australia, is asking bids until March 29 for transformers and other electrical equipment. Specifications available at the New York and Chicago offices of the Bureau of Foreign and Domestic Commerce, Washington.

Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE prices are given for the convenience of small-lot buyers whose requirements do not run into mill-size orders.

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates	
	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in. base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel	
	Per Lb.
Tire, 1½ x ½ in. and larger	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.65c.
Toe-calk, ½ x ¾ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	6.25c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds and hex.	4.00c. to 5.00c.
Squares and flats	4.50c. to 5.50c.
Standard tool steel, base price	12.00c.
Extra tool steel	15.00c. to 18.00c.
Special tool steel	20.00c. to 23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets	
Blue Annealed	
	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black	
	Per Lb.
Nos. 18 to 20	4.15c. to 4.30c.
Nos. 22 and 24	4.20c. to 4.35c.
No. 26	4.25c. to 4.40c.
No. 28*	4.35c. to 4.50c.
No. 30	4.55c. to 4.70c.

Galvanized	
	Per Lb.
No. 14	4.45c. to 4.60c.
No. 16	4.60c. to 4.75c.
Nos. 18 and 20	4.75c. to 4.90c.
Nos. 22 and 24	4.90c. to 5.05c.
No. 26	5.05c. to 5.20c.
No. 28*	5.35c. to 5.50c.
No. 30	5.85c. to 6.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Standard Steel	
	Black Galv.
½ in. Butt...	46 29
¾ in. Butt...	51 37
1-3 in. Butt...	53 39
2½-6 in. Lap...	48 35
7 & 8 in. Lap...	44 17
11 & 12 in. Lap	37 12

Wrought Iron	
	Black Galv.
½ in. Butt...	4 19
¾ in. Butt...	11 9
1-1½ in. Butt	14 6
2-in. Lap...	5 14
3-6 in. Lap...	11 6
7-12 in. Lap...	3 16

Bolts and Screws	
Machine bolts, cut thread, 40 and 10 per cent off list	
Carriage bolts, cut thread, 30 and 10 per cent off list	
Coach screws, 40 and 10 per cent off list	
Wood screws, flat head iron,	
80, 20, 10 and 10 per cent off list	

Steel Wire

BASE PRICE† ON NO. 9 GAGE AND COARSER

Per Lb.

Bright, basic 4.25c.

Annealed, soft 4.50c.

Galvanized, annealed 5.15c.

Coppered, basic 5.15c.

Tinned, soft Bessemer 6.15c.

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire	
BASE PRICE	
High brass sheet	19½c. to 20½c.
High brass wire	19½c. to 20½c.
Brass rods	16½c. to 17½c.
Brass tube, brazed	27½c. to 28½c.
Brass tube, seamless	23½c. to 24½c.
Copper tube, seamless	24½c. to 25½c.

Copper Sheets	
Sheet copper, hot rolled, 22½c. to 23½c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates	
	Coke—14x20
Bright Tin	
Grade "AAA"	Grade "A"
Charcoal 14x20	Charcoal 14x20
IC..\$11.25	\$8.85
IX.. 12.85	10.85
IXX.. 14.40	12.55
IXXX.. 15.75	13.85
IXXXX.. 17.00	15.05

Terne Plates	
	14 x 20
IC—8-lb. coating	\$7.75 to \$8.00
IC—20-lb. coating	10.00 to 11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25
Fire-door stock	10.50

Tin	
Straits, pig	64½c. to 65c.
Bar	68½c. to 69c.

Copper	
Lake ingot	15 c.
Electrolytic	14¾c.
Casting	14½c.

Spelter and Sheet Zinc	
Western spelter	9¾c. to 9¾c.
Sheet zinc, No. 9 base, casks.....	13¼c.; open, 13¾c.

Lead and Solder*	
American pig lead	10¼c. to 11¼c.
Bar lead	12¼c. to 13¼c.
Solder, ½ and ½ guaranteed.....	42¼c.
No. 1 solder	39¼c.
Refined solder	33c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.....	68c. to 72c.
Commercial grade, per lb.....	30c. to 35c.

Antimony	
Asiatic	25c. to 26c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb....	30c. to 30½c.

Old Metals

Business is quiet. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.50
Copper, light bottoms	9.50
Brass, heavy	7.00
Brass, light	6.00
Heavy machine composition	8.75
No. 1 yellow brass turnings	8.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	8.00
Lead, tea	6.00
Zinc	5.25
Cast aluminum	19.00
Sheet aluminum	19.00